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Capturing learnings from advanced demand planning tool implementation to utilize in planning development and in future ERP implementation

Master's Thesis

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Abstract

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The main purpose of this Master Thesis is practical: to help with the preparation of Vaasan's BP2.0 implementation. To accomplish our goal, we will use the learnings from a previous demand planning tool (SO99) implementation to define future needs in the planning stream and identify possible gaps in the implementation plan provided by Lantmännen Unibake. This study follows a Design Science approach and is conducted using qualitative research methods in a single-case study. Four feasible and extrapolable solutions are proposed to fill the most relevant gaps discovered during the process; they are going to facilitate the change in the planning stream during the future implementation. Another key contribution of this thesis is that brings to the literature a case study analyzed in detail where diverse factors of the context make it unique. Learning from the past is a useful tool that everybody can use in a structured way and, supported by a design thinking approach, has proved to be a powerful combination.

Keywords: ERP implementation, Design Science, Critical Success Factors | **Publishing language**: English

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Table of contents

List of tables

List of figures

1. Introduction

1.1. Background and justification

The manufacturing sector is currently saturated with Industry 4.0 hype and jargon. This is no surprise given the evidence showing that the connectivity of systems and exploitation of data can add significant value to modern manufacturing processes and supply chains. Businesses that invest correctly and harness the enhanced capabilities offered from digitizing their industrial assets will benefit from greater insight into their business operations, increased agility at lower cost and the potential to respond to individual customer requirements.

Digitization strategies are dominating board discussions, and it is clear that waiting for others to lead the way is not an option because the competitive risks are so high. The challenge for many businesses is knowing where to begin (Aitken, 2017). Here it is important to mention that digitization is not only about choosing one of the cool new digital technologies that have become available, it is a huge transformation process that requires a lot of time and exhaustive preparation, and there are many businesses that are not ready yet to carry it out (Giffi, 2018).

It is important to know where your company currently is, in order to make the right decisions. Probably these decisions will be more related with catching up on the third industrial revolution, when issues like automation, computers and electronics emerged for the first time. For instance, it is fundamental to decide the optimal level of automation in your factories or implement a common ERP across different countries if required. Although it may seem that they are issues of the past, actually a lot of companies are still dealing with them or are even far from their successful implementations. Anyhow they are the essential basis for further steps.

For this thesis, it is important to understand what an Enterprise Resource Planning (ERP) is and the implications of its implementation. The term ERP can mean different things, depending on one's viewpoint. From the view of managers in a company, the emphasis is on the word planning, ERP represents a comprehensive software approach to support decisions concurrent with planning and controlling the business. On the other hand, for the information technology community, ERP is a term to describe a software system that integrates application programs in finance, manufacturing, logistics, sales and marketing, human resources, and the other functions in a firm. This integration is accomplished through a database shared by all the functions in the firm.

The ERP provides real-time data to support better routine decision making, improves the efficiency of transaction processing, fosters cross-functional integration and provides improved insights into how the business should be run. Benefit is gained from the elimination of redundant processes, increased accuracy in information and improved speed in responding to customer requirements. In most companies, ERP provides the information backbone needed to manage day-to-day execution (Jacobs, Berry, Whybark, & Vollmann, 2011).

"Analyst firm Gartner estimates that 55% to 75% of all ERP projects fail to meet their objectives" (Turbet)

The implementation of ERP systems is generally considered a complex undertaking for many organizations. Aiming to provide enterprise-wide integration of business processes, ERP systems are cross functional by nature. ERP implementation projects therefore require the management of a complex combination of technical, organizational and environmental aspects (Esteves J. M., 2014). An ERP system implementation can be difficult, time-consuming and expensive for organizations.

Vaasan is a Finnish bakery company that also operates in the Baltic countries and which was acquired by Lantmännen Unibake in 2015. Lantmännen Unibake is one of Europe's largest bakery groups with 35 bakeries in 15 countries, has a turnover of EUR 1.1 billion and employs 6,000 people in more than 20 countries (Lantmännen Unibake, 2018).

Business Platform 2.0 (BP2.0) programme in Lantmännen Unibake eventually involves all of its countries and consists of an ERP implementation and processes standardization. Vaasan cluster is scheduled to start soon the local implementation project of BP2.0. As all processes will be standardized the project will require extremely thorough preparation and collaboration both across the whole cluster and with Unibake.

As we have said before, an ERP implementation is per se a critical step for any company, so considering that this project is also about learning a common way of working implemented by Lantmännen Unibake across many different countries. That adds a lot of complexity and gives us an idea of the great size and importance of the project. Therefore, the preparation phase in Vaasan will be especially key to achieve a successful implementation.

"The small and the simple is the foundation for the large and complex" (Schaeffer, 2017)

Using that lesson in our context, we decided to center our attention in a Demand Planning tool (SO99) implementation project that Vaasan carried out two years ago. During the implementation of BP2.0, there will be eight streams (Planning, Sales, Finance, etc.) which represent each area of the company. The idea is that one of those streams, in our case Planning, can learn from a smaller scale and less complex project (SO99) in order to apply those learnings in BP2.0. Focusing only in the SO99 project, will allow us to analyse it more in depth.

Also, as mentioned earlier, Vaasan is not independent in BP2.0. From Unibake they receive the ERP version, the project structure and schedule, the definition of streams, some resources, project tools and methods; practically everything related to the project. Because of that, this Master Thesis wants to contribute helping to understand and adapt those inputs from the mother company to identify and solve current and future needs in the Vaasan BP2.0. implementation also based on the learnings coming from SO99.

1.2. Research questions, objectives and scope

The research questions were formulated initially as part of the research plan, but they have been modified during the thesis development, including new nuances as they were discovered. The final questions are shown below:

- What learnings from demand planning tool implementation can be used in BP2.0. implementation & planning development and how?
- What requirements does BP2.0. implementation set to organization, roles and capabilities?
- How the analysis of a previous implementation project in a concrete stream can systematically help to identify gaps in an ERP implementation project?

The last research question is more academic, but the main purpose of this Master Thesis is practical: to help with the preparation of Vaasan's BP2.0 implementation. To accomplish our goal, we will use the learnings from the previous demand planning tool (SO99) implementation to see where would be interesting to act in BP2.0 preparation. This approach can also facilitate the understanding of possible constraints that they (both the company and individuals) could face during such future project.

The most important objectives that we pursue in this dissertation are:

- To find learnings from demand planning tool implementation and critical areas to focus on.
- To define future needs in planning stream and try to minimize the main risks.
- To identify possible gaps in the implementation plan provided by Unibake and create solutions to fill them.

Most of these objectives were established from the beginning, but like in the case of the research questions, some of them arose during the process.

Although the scope is the Planning stream in Vaasan Fresh (Finland, Estonia, Latvia and Lithuania), the outcomes can be used by other streams in Vaasan implementation and by Unibake in BP2.0 implementations for other countries. For that reason, our aim is to develop solutions that can be extrapolated to other areas and countries.

1.3. Structure of the thesis

This Master Thesis is organized as follows. Following this introduction, we present a literature review about the most relevant points regarding ERP implementations, where the content is quite broad. The methodology section describes how we will apply the design science approach in our case of study. The empirical analysis and results starts with the case context and presents the process to address the problem. After that, the design propositions and outcome evaluation are developed. To conclude, we relate our design and propositions to previous research and present implications for research and practice.

2. Literature review

2.1. Putting the Enterprise into the Enterprise System

The ERP literature is vast, dates back almost three decades, and provide a rich source of information on ERP implementations. It covers many different topics, but definitely the area of most focus in the literature is on Critical Success Factors (CSFs). However, other interesting research streams have been also compiled in the following points.

The growing number of horror stories about failed or out-of-control ERP implementation projects should certainly give managers pause. Some of the blame for such debacles lies with the enormous technical challenges of rolling out enterprise systems (ES). But technical challenges, however great, are not the main reason enterprise system fail. The biggest problems are business problems. Companies fail to reconcile the technological imperatives of the enterprise system with the business needs of the enterprise itself (Davenport, 1998).

An enterprise system, by its very nature, imposes its own logic on a company's strategy, organization and culture. It pushes a company toward full integration even when a certain degree of business unit segregation may be in its best interests. And it pushes a company toward generic processes even when customized processes may be a source of competitive advantage. If a company rushes to install an enterprise system without first having a clear understanding of the business implications, the dream of integration can quickly turn into a night-mare.

When developing information systems in the past, companies would first decide how they wanted to do business and then choose a software package that would support their proprietary processes. They often rewrote large portions of the software code to ensure a tight fit. With enterprise systems, however, the sequence is reversed. The business often must be modified to fit the system. An ES is, after all, a generic solution. Its design reflects a series of assumptions about the way companies operate in general, but it is the vendor, not the customer, that is defining what "best" means (Davenport, 1998).

For a multinational corporation, enterprise systems raise another important organizational question: How much uniformity should exist in the way is does business in different regions or countries? For most companies, differences in regional markets remain so profound that strict process uniformity would be counterproductive.

The worst thing a company can do is to make decisions about a system based on technical criteria alone. Companies deriving the greatest benefits from their systems are those that, from the start, viewed them primarily in strategic and organizational terms. They stressed the enterprise, not the system. Computer systems alone don't change organizational behaviour.

Many chief executives, however, continue to view the installation of an ES as primarily a technological challenge. They push responsibility for it down to their information technology departments and, due to ES's profound business implications, off-loading responsibility to technologist is particularly dangerous. Only a general manager is equipped to act as the mediator between the imperatives of the technology and the

imperatives of the business. If the development of an enterprise system is not carefully controlled by management, management may soon find itself under the control of the system (Davenport, 1998).

Figure 1. Management under the control of the system (Brown, 2008)

2.2. Critical Success Factors in an ERP implementation

In an effort to remain competitive, there has been an increasing need in organizations to connect the information supplied by each department into a common entity. ERP systems are designed to address this problem of fragmentation as they integrate and streamline internal processes by providing a suite of software modules that cover all functional areas of a business. However, increasingly, there have been failures of ERP implementations or the complete abandonment of the system. Resultantly, there has been expanded research focusing on the implementation process and its CSFs.

The process of identifying CSFs helps to ensure that those factors receive the necessary attention and the procedure allows for clear definition of the type of information that the company needs. CSFs are those specifically distinguished areas that an organization need to "get right" in order for the business to successfully compete. In terms of an ERP implementation, the CSFs are those conditions that must be met in order for the implementation process to occur successfully (Rockhart, 1979).

The literature has focused on success factors but with very limited or no regard to stakeholder perspective. While there have been several studies that have attempted to interview representatives from various stakeholder groups, they have not reported findings so that individual views of different stakeholder groups are clearly represented. For a project implementation team, a more intimate understanding of CSFs of the various stakeholder groups would make it possible to assess the project planning phases and determine if the concerns of these relevant groups are being addressed as affectively as possible. Ultimately, this will enhance the probability of achieving higher success levels and, resultantly, timesaving, cost savings, quality and efficiency in their system. It is further suggested that in order to better manage implementations, focus should be placed on those persons who do not perceive the implementation as being successful. If those with negative perceptions can be identified, and if they belong to predominantly one stakeholder group, it might be possible to concentrate on those CSFs that are important to them (Finney & Corbett, 2007).

There has been some criticism of the CSF approach because it is felt that the approach relied too much on the opinions of managers only and it was, therefore, biased. The implementation of a new technology in a company can be expected to affect more than just managers, it is, therefore, necessary to consider the opinions of all those affected stakeholder groups, regardless of their placement within the organizational chart. If CSF are those factors that the organization must "get right" in order to achieve success, should not it be necessary to ask all those affected just exactly what "right" is? Further, different facets of an implementation affect some stakeholder groups more than others and some groups are more qualified to comment on certain aspects than others. Surprisingly, the role of top management support is found to be less important than that provided by users (Maditinos, Chatzoudes, & Tsairidis, 2011).

The literature identifies several CSFs which influence and guide successful ERP implementations, and which have a direct impact on their outcome. The success factors compilation below provides a foundation with respect to the range of success factors that are cited in the literature, and the frequency associated with each (Finney & Corbett, 2007):

CSF category	Number of instances cited in literature
Top management commitment and support	25
Change Management	25
BPR and software configuration	23
Training and job redesign	23
Project team: the best and brightest	21
Implementation strategy and timeframe	17
Consultant selection and relationship	16
Visioning and planning	15
Balanced team	12
Project champion	10
Communication plan	10
IT infrastructure	8
Managing cultural change	7
Post-implementation evaluation	7
Selection of ERP	7
Team morale and motivation	6
Vanilla ERP	6
Project management	6
Crises management	6
Legacy system consideration	5
Data conversion and integrity	5
System testing	5
Client consultation	4
Project cost planning and management	4
Build a business case	3
Empowered decision makers	3

Table 1: Frequency analysis of CSFs in literature (Finney & Corbett, 2007)

The literature shows that top management team support, good project teams and good communication are the three most important CSFs for achieving successful implementations. The most common cause of ERP implementation failure identified is a combination of poor planning and high customization of ERP software.

According to (Esteves & Bohórquez, 2001-2005) classification of the ERP lifecycle framework, focusing on the three essential implementation phases, pre-implementation, implementation and post-implementation, we are going to review each phase relevance.

Pre-implementation

Pre-implementation is a critical phase, as the steps taken, and strategies adopted will have a direct impact on the implementation process and the outcome of the implementation. The authors suggest that the pre-implementation phase demands additional research attention because of its role in shaping the attitude of those who will be charged with the implementation. They also identify the complete understanding of CSFs as one of the most important factors for pre-implementation consideration.

Implementation

The implementation phase can take a long period of time and identifying when it ends could be difficult. This is because this phase involves various activities essential for the success of the implementation, therefore, is one of the most vulnerable to failure.

Post-implementation

ERP system implementation do not end once the system becomes operational. The post-implementation or exploitation stage is where the real challenges begin, so more resources are required (figure 2). The literature is consistent in observing the importance of evaluating ERP system post-implementation performance.

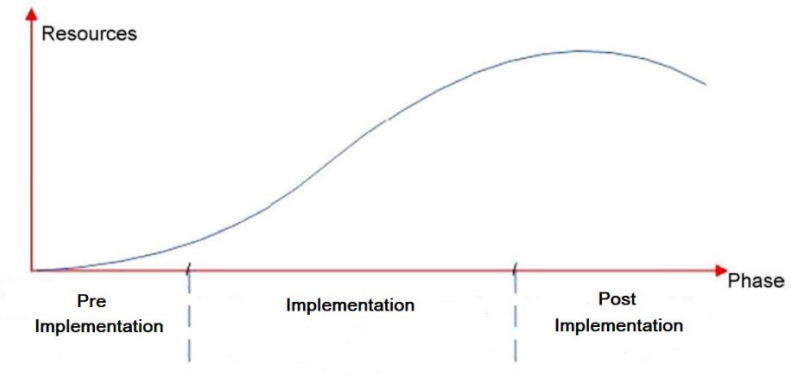

Figure 2. ERP life cycle modified from (Ali & Miller, 2017)

2.3. Risk management in ERP project introduction

Researchers have pointed out that there is a substantial difference between an ERP project and a simple software project. An ERP project is strategic and involves several

components of software and business systems, so must be approached as such. One reason often cited for any software project failure is that managers do not properly assess and manage the risk involved in their projects. Most project managers perceive risk management processes as extra work and expense; thus, risk management processes are often expunged if a project schedule slips.

In the past, several ways were proposed in order to improve the success rate of ERP introduction, unfortunately without great effect. The nature of IT project risk is determined by the risk factors and by the strategic need for the project, innovation, repetition of failed experience, etc. Some well-known models to address the need for a more effective risk management include PMI 2001, Standards Australia 1999, SAFE methodology and Risk Diagnosing Methodology are typical iterative approaches to manage risk successfully.

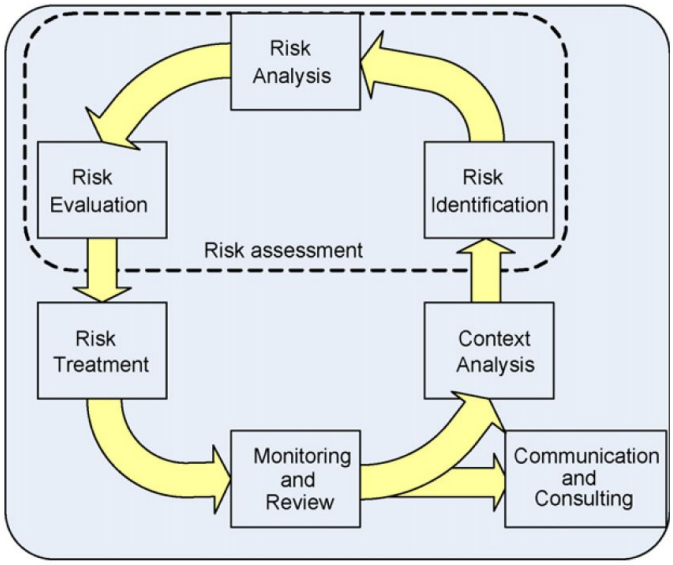

Figure 3. Risk management phases (Aloini, Dulmin, & Mininno, 2007)

ERP projects are interdisciplinary; they affect interdependencies between business processes, software and process reengineering. Critical factors include technological and management aspects and, to be effective, a risk assessment should consider several potential aspects linking them to the project life cycle. This ensures the selection of the most appropriate risk treatment strategy. Risk management strategy consists of two approaches. The first aims at reducing risky circumstances, while the second deals with risk treatment after a risk appears (Aloini, Dulmin, & Mininno, 2007).

According to literature, the top 5 researched risk factors were: inadequate ERP selection, ineffective strategic thinking and planning, ineffective project management techniques, bad managerial conduction and inadequate change management.

Researchers have described ERP life cycle using different models according to the target application, some with a few general stages, like the three of Deloitte Consulting's (ERP's second wave: maximizing the value of ERP enabled processes, 1998), while others are more analytic having five or more phases, such as Ross and Vitale's or Rajagopal models (Rajagopal, 2002). Identifying risks can be a challenge for managers, especially because there are different ways in which they can be described and categorized. Often terms as

"risk factors", "Critical Success Factors" and "Uncertainty factors" are used to convey also the same concept. Normally, risk factors occur early and have a pervasive impact during all the ERP project lifecycle.

2.4. Stakeholder Analysis & Communication Plan

The management of project stakeholders is a task of growing importance for project managers (Calvert, 1995). Understanding their interests and relative power is vital for the effective management of the initial stages of many projects as the scope is defined.

A stakeholder analysis is a useful way to identify the people who need to know about the change and their likely concerns. The following is the most common guide in the literature to develop a Stakeholder analysis (Guide for leading change: Stakeholder Analysis & Communication Plan):

Step 1: Identify your stakeholders

Identify all those who can contribute to or are impacted by the project. This can be achieved doing a stakeholder list through a brainstorming activity.

Step 2: Categorise your stakeholders

It can be useful to categorise your stakeholders according to influence and attention. One can map now each stakeholder group onto the Power/Interest matrix.

Step 3: Understand your key stakeholders and act

Here the project managers put themselves in the stakeholders' place to understand how the key stakeholders feel about the project and their perception of its advantages and disadvantages. Then, determine specific initiatives. This is usually done with a table template, which is an input for the communication plan.

An intermediate step between 1 and 2 called stakeholder mapping is also proposed by (Bijker, 1987). This innovative approach is inspired by theories of social constructivism, typically known as the Social Construction of Technology (SCOT). Theories regarding technology as being socially constructed basically see technological development as arising from negotiations between different actors, organized in relevant social groups, each having their own comprehension of the problems to be solved and of the solution available.

SCOT theory's main conceptual relations are covered by the terms artifact, relevant social group and technological frame. In this context the artifact equals the project mission. Correspondingly, the relevant social group represents a project stakeholder. Finally, technological frame defines the scope of a social group's actions and articulates the preferred technological solutions in terms of problems and preferred solutions (Graham & Sten, 2002).

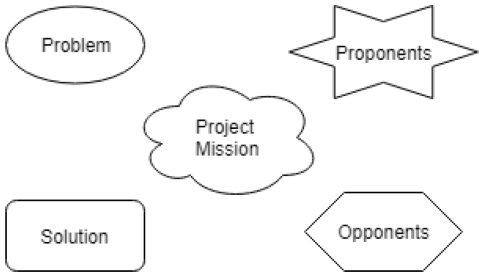

Figure 4. Code to Stakeholder Maps (Graham & Sten, 2002)

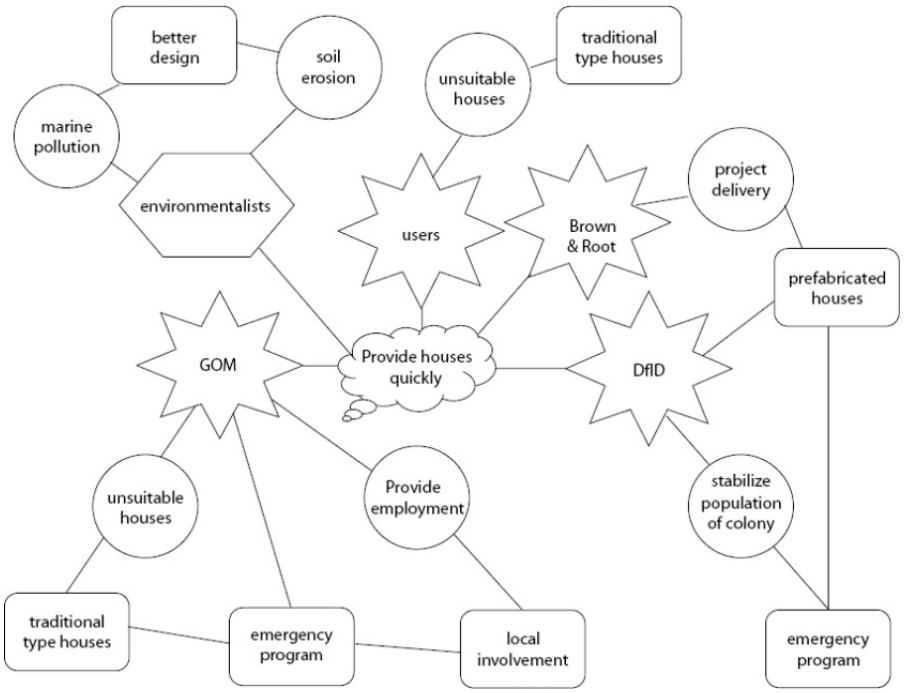

Figure 5. An example of a Stakeholder Map (Graham & Sten, 2002)

Obviously, identifying the complete set of stakeholders is of great importance to the validity and usefulness of the mapping method. During this process all stakeholders must be identified, not on the basis of a priori distinctions between, but rather from the perspective that any actor who possesses an interest in the project and the solutions to its problems should be considered a relevant stakeholder. It is crucial for the manager of a project to realize that each stakeholder will be interpreting the project differently.

Once the stakeholder map is prepared, it can be analysed using a power/interest matrix (step 2). There are two dimensions to the matrix: the level of interest of the stakeholder in the project and the stakeholder's power to influence the definition of the project mission. The four basic categorizations of stakeholders are shown below:

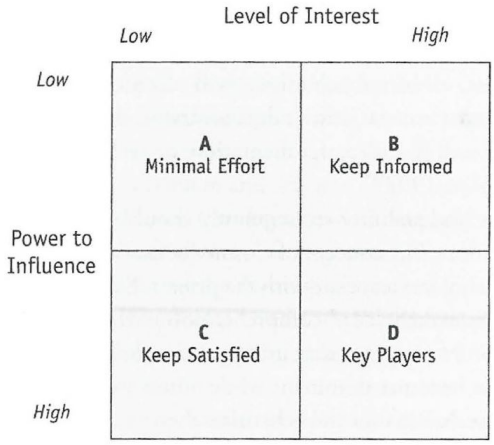

Figure 6. Categorization of Stakeholders (Graham & Sten, 2002)

Those in category A require minimal effort but should still be watched in case their power or interest rises as circumstances change. Those in category B need to be kept informed of progress and be treated with diplomacy. Again, signs that stakeholders here may gain power need to be watched for. Those in category C need to be kept satisfied, their power over the project is considerable but their interest may be fairly low. The final group D are the key players, those committed totally to the project (Graham & Sten, 2002).

The degree of integration of the stakeholder map will make a large difference in its manageability. If the stakeholders are at the far corners of Figure 6, then the definition process is likely to be turbulent and the process map unstable. If the stakeholders are clustered near the center of Figure 6, then the map will appear as relatively stable.

Although the stakeholder mapping approach presented here has been developed in the context of major building and civil engineering projects, its application is much wider. It provides the basis for an effective stakeholder management strategy, as it identifies what sort of communication strategies different stakeholders might accept, and the sort of compromises that would have to be made to ensure their commitment to the project. The stakeholder map and power/interest matrix are also proposed as tools for facilitating a more rigorous analysis of the potential threats to the project.

The Communication Plan gives the project manager a planned, structured approach to communications and ensures that all the key stakeholders are consulted on their areas of interest and concerns. There are two important factors to consider: the key messages we want to communicate and the channels of communication available. It is important to consider multiple channels, they include meetings, newsletters, project briefs, emails, teleconferences, video link, etc. The most common way to develop this plan is filling out templates in the form of tables.

2.5. Managing the ups and downs of Change Communication

The change curve (see figure 7) was originally constructed by Elisabeth Kubler Ross, a Swiss psychiatrist. She found that the cycle of emotions during critical changes was highly consistent and, although all individuals experienced it, the clear majority of individuals emerged from the low point to eventual acceptance of the situation. However,

there were differences in the speed with which individuals moved through the cycle and in the depth of the low point.

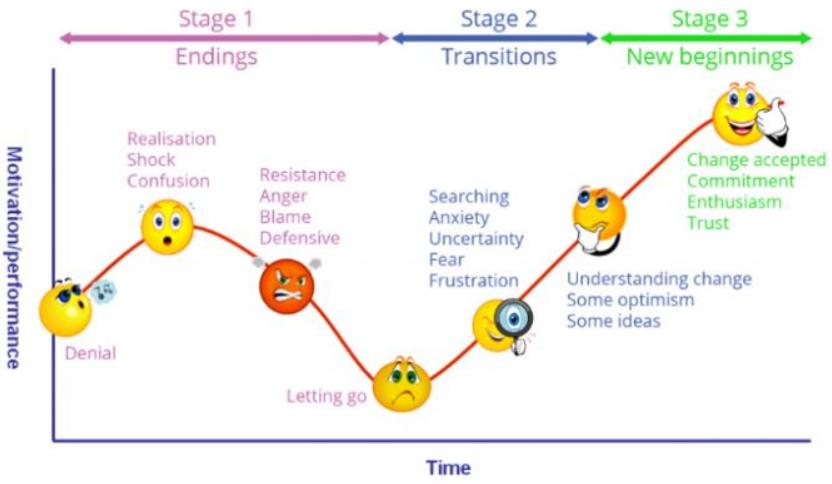

Figure 7. Kubler Ross change curve

For a start, the change curve can help us understand where our audience currently is, psychologically and emotionally. The clues are subtle and require good listening. When individuals or groups are to the left of the midpoint on the curve (see figure 8) they are still rooted in the old world. Those on the left talk in the past tense and those on the right-hand side talk more frequently in the future tense. When people are in the top half of the chart they will talk openly about how they feel but in the bottom half their emotions and reactions tend to be hidden. The real danger zone for organizations and individuals is staying too long in the bottom left.

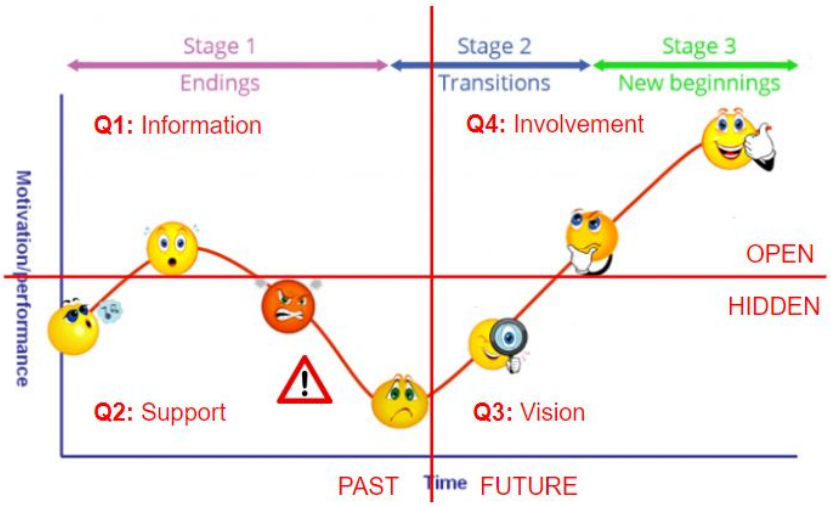

Figure 8. Change curve quadrants

If we know which quadrant the majority of our audience is in, we can ensure we plan a communication intervention that will best address their psychological state of mind. The aim should be to help them through the cycle as fast as possible and ensure that the curve is not too deep. Let's now look at each quadrant and the types of communication interventions that work best (Wiggins, 2009):

Quadrant 1

The news breaks and employees are hungry for information. When we talk about change communication, people often mean activities in quadrant 1. This is an area where many managers have much practice. Here repetition is fundamental and, for managers, is important to show their reasoning and interpretations, the why of all their decisions.

Quadrant 2

The news sinks in and the need is for support. This isn't the time for broadcasting messages to the masses or giving encouraging exhortations about the new world. Employees are just not able to absorb such communication when they are in this quadrant. Instead, the focus should be on individuals and small groups and giving employees the space to explore the implications of the change for them, to let them be heard and to articulate their emotions. In this quadrant many communication mechanisms are proposed, but whichever you choose it's important to coach leaders beforehand to ensure that they understand their role; to remind them that they need to encourage empathy.

Quadrant 3 and 4

Employees start focusing on the future and need help to see where they and the company are going (visibility). When they start to accept the situation, the goal is to involve them to build commitment and integration. The communication interventions need to be designed to help them focus on the future and feel ongoing involvement. An example of an intervention to foster involvement is communication circles.

2.6. Training best practices for ERP implementation projects

A study found that though ERP training averaged 8% of the total project cost, the actual training costs range up to 30% of the total costs (Beatty & Williams, 2006). Unfortunately, the literature suggests that these investments are often wasted as employees do not transfer the learned Information Technology (IT) skills to their work. Sometimes, due to the short time period of ERP implementations, it is difficult for trainers or consultants to pass their knowledge to the employees in the required time.

In order to realise the significant benefits from ERP systems, a considerable amount of training is required. ERP training is more than simply learning how to use the software and hardware in a system but also managing change and the concepts of process-orientation. Effective training is an invaluable factor when it comes to generating a positive attitude towards the system and boosting the acceptance of users. Thus, there must be a training plan to ensure that they understand the ERP, if not, they will invent new ways of using it and focus only on the processes they know how to manage. It is crucial to understand the role of each stakeholder in the design of the ERP training plan. An organization may have to undertake ERP training for three different groups (Kale, 2000):

- The managerial personnel, members of the functional team.

- Key Users who form the core of the super-users, who will be responsible to train end-users.
- All other end-users, who would be using the system as part of their routine operational duties.

The consensus that is emerging in relation to ERP training is that the training that matters is not technological but rather that it must develop the ability to figure out the underlying flow of information through the business itself. This is not merely training in using the new system but also in the new processes and in understanding the integration within the system, how the work of one employee influences the work of others (Wheatley, 2000).

Training strategies should be developed in advance and continually updated during the implementation. Formal training of all users is not normally deployed at the beginning of the implementation. Poor end-user training is a common problem in all ERP implementations.

The research (Esteves J. M., 2014) suggest that company size and location have an impact on training best practice relevance. The type of ERP to be implemented does not affect the training activities. It is highlighted the importance of analysing informal training and the users' involvement in the design of ERP training, what can increase their motivation.

2.7. Kirkpatrick's Four-Level Training Evaluation Model

The Four Levels of Evaluation, also referred to as the Kirkpatrick Evaluation Model, was created by Donald Kirkpatrick during 1950s to define the four levels of training evaluation. Today, it is the most recognized method of evaluating the effectiveness of training programs. Each of the four levels is explained below (Kirkpatrick, 2013):

Level 1 – Reaction

This level measure how your trainees reacted to the training and their thoughts about the training experience. Typical questions concern the degree to which the experience was valuable (satisfaction), whether they felt engaged, and whether they felt the training was relevant. Organizations use that feedback to evaluate the effectiveness of the training, trainees' perceptions, potential future improvements and justification for the training expense. A variety of sources estimate that approximately 80% of trainings events include the evaluation of this level.

To do this you will typically use employee satisfaction surveys or questionnaires, however, you can also watch trainees' body language during the training and get verbal feedback by asking trainees directly about their experience.

Level 2 – Learning

Here you measure the degree to which participants acquired the intended knowledge, skills and attitudes as a result of the training. This level is used by instructors to determine if training objectives are being met. Only by determining what trainees are learning, and what they are not, organizations can make necessary improvements. Level 2 can be completed as a pre and post-event evaluation, or only as a post-evaluation.

Level 3 – Behaviour

Level 3 measures the degree to which participants' behaviours change as a result of the training, basically whether the knowledge and skills from the training are then applied on the job. This measurement can be, but is not necessarily, a reflection of whether participants actually learned the subject material. For example, the failure of behavioural change can be due to other circumstances such as individual's reluctance to change. This evaluation involves both pre and post-event measurements.

Level 4 – Results

Level 4 seeks to determine the tangible results of the training such as: reduced cost, improved quality and efficiency, increased productivity, employee retention, increased sales and higher morale. While such benchmarks are not always easy or inexpensive to quantify doing so is the only way organizations can determine the critical Return on Investment (ROI) of their training expenditures. One typical challenge is to identify whether specific outcomes are truly the result of the training. Again, this level requires both pre and post-event measurements.

Although Kirkpatrick's Four-Level Training Evaluation Model is popular and widely used, there are a number of considerations that need to be taken into account when using the model.

One issue is that it can be time-consuming and expensive to use levels 3 or 4 of the model, so it is not practical for all organizations and situations. This is especially the case for organizations that don't have a dedicated training or human resource department. The model also assumes that each level's importance is greater than the previous one, and that all levels are linked. For instance, it implies that Reaction is less important, ultimately, than Results but in practice might not be the case. This model is great for trying to evaluate trainings in a "scientific" way, however, so many variables can be changing in fast-changing organizations that analysis at level 4 can be limited in usefulness.

2.8. Summary of Research Gaps

Past ERP implementation research may be described as factor research, which involves identifying the factors or variables that are critical for implementing ERP successfully. Although factor research is valuable for advancing our understanding of ERP implementation success, it adopts a rather static view, which limits its adequacy in explaining the dynamic of the implementation process. Thus, factor research alone is not adequate for explaining how the transition from resistance to success has happened. Unlike factor research, process research helps us understand how ERP implementation efforts have happened; it therefore gives a moving picture about how we got from time 1 to time 2. To benefit from the two perspectives, it is necessary to adopt an integrated view in ERP implementations (Aladwani , 2001).

What became most apparent from the CSFs literature review is the lack of depth in the coverage of them. Additionally, another significant observation was the lack of stakeholder perspective in the success factors cited. Either success factors were presented with no explanation of whose perspective was represented; or stakeholder perspective

was provided, but for only a single success factor. Finally, the concept of change management, one of the most widely cited success factors, appeared to have varied definitions and there was little explanation of the specific tactics that could be used. Many strategies have been covered, however, strategies alone are not sufficient. The article (Aladwani , 2001) might offer the only literature that actually suggests strategies and tactics that may be introduced to implement an ERP project.

Researchers have very often focused on only a specific phase of the implementation process, specific CSFs or compared the relative importance of CSFs. Consequently, there is little research documented that encompasses all significant CSFs considerations. It is interesting to note that researchers have focused more on the implementation phase while research in pre and post-implementation is limited. Researchers should focus less on techniques using simply questionnaires and more on empirical or case studies of organizations that have adapted ERP systems to better understand actual problems faced during pre and post-implementation. It is this critical and missing knowledge that the existing literature fails to adequately address and provide solutions for. It is no longer adequate for the future literature to simply regurgitate the findings of current studies. One key limitation of many research is the risk of duplication in the frequency analysis of the success factors (Ali & Miller, 2017).

Many processes have been developed in recent years to address the need for a more effective risk management, though they are often too general for ERP application. Articles proposing specific risk treatment strategies and techniques are very limited. Moreover, it is important to note that despite of the great importance reserved to factors linked to project management and change management areas, only a few articles dealt with them (Aloini, Dulmin, & Mininno, 2007).

Although training is one of the most cited critical success factors in ERP systems implementations, few empirical studies have attempted to examine the characteristics of management of the training process within ERP implementation projects. Analysis of the Information Systems (IS) literature on training shows that most of the research studies have focused on the effects and impact of trainings on IS implementation success. However, few studies have focused on the best practices to conduct that training (Esteves J. M., 2014).

Greater understanding is required of the shifting nature of the stakeholder map through time. This is particularly important if projects are phased and stakeholders learn from their experiences in the earlier phases (Graham & Sten, 2002). In the literature there are missing new uses for stakeholder mapping application in different contexts.

Future research needs to be more innovative and focus more specifically on areas of ERP implementation where critical knowledge remains missing. The literature provides a myriad of different models designed to overcome ERP implementation challenges. However, one of the most difficult and yet unresolved areas of ERP implementation is identifying and agreeing on industry standard implementation model (Ali & Miller, 2017).

3. Methodology

3.1. Research approach

Considering the gaps in the literature review, this study follows a Design Science approach that can help us to focus on discovery and problem solving as opposed to accumulation of theoretical knowledge (Holmström, Ketokivi, & Hameri , Bridging Practice and Theory: A Design Science Approach, 2009). In order to understand better the ”Design Science” concept, we are going to introduce first we are going to introduce the generic term ”Design Thinking” (Brown, 2008):

”Design thinking is a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity”

Desirability for users, technical feasibility and economic viability are a Design Thinking process’ main focuses. Design Thinking is essentially a group of processes in which everyone involved in using a final product or service is consulted; either through interviews or as a participant in brainstorming, debate and practical work of various kinds. A key aim is to break down the silos that usually separate relevant parties (Schaeffer, 2017).

Getting the product or service to work for the people who use it is Design Thinking’s ultimate focus. The methodology’s simple but surprisingly revolutionary innovation, therefore, is to always include end-users in the design process. The great advantage of this is that people often reveal needs of which they themselves were unaware. Palpable outcomes in Design Thinking approach are conceived much earlier than in conventional development processes. Design Thinking in many ways replaces classic market research and target group analysis. What a customer really wants often remains a mystery with these methods, whereas Design Thinking can often unearth very authentic consumer demands.

Historically, design has been treated as a downstream step in the development process. Now, rather than asking designers to make an already developed idea more attractive to customers, companies are asking them to create ideas that better meet customer’s needs and desires, and this implies their enrollment in early phases of the process. As we can see, Design Thinking is a creative human-centered discovery process, and we should highlight its iterative nature, since projects will loop back through their steps more than once as ideas are refined and new direction taken.

In an ERP implementation, the people involved in the project is, without a doubt, a critical factor for a successful implementation. Due to this fact, a design thinking approach can guide our research to center our attention in the different stakeholders, especially end-users, trying to understand their needs and creating effective and feasible solutions for them.

Changing to the concrete description of Design Science, we can start saying that many times theoretical and academic research interests do not seem to coincide with the interests of managerial practice. Recognizing and building on this complementarity is

especially crucial, because problem-solving oriented research produces the very artifacts (e.g. technologies) that empirical research subsequently evaluates in an attempt to build explanatory theory. Design science approach bridges practice to theory rather than theory to practice. Then, should be the scientist a merely observer and evaluator of the practitioners' problem-solving activity? Or become problem solvers? Design Science approach support that the task of the scientist should extend beyond theoretical explanation to actual problem solving.

Design Science is rarely used research approach. The primary goal of research articles is to advance theory and to produce academic publications, not to improve practice. Research interest tends to become theoretical and the implications to managerial practice are secondary in importance. This characterizes much of empirical research: theoretical contribution first, managerial relevance second. The strength of the design science approach is its explicit focus on improving practice.

Design science research is also conducted under many different rubrics: action science, action research, action innovation research, etc. As one can observe, the word "action" has a strong relationship with design science. This research wants to be proactive and, learning during the way, analyze possible gaps and act where we see an opportunity. Moreover, the company has the possibility to really apply the solution proposals before they start with the ERP implementation at the beginning of next year.

Involving theoretically inclined researchers in the early phases of design science research can produce three kinds of benefits (Holmström, Ketokivi, & Hameri , Bridging Practice and Theory: A Design Science Approach, 2009). First, theoretical expertise can be useful in the iterative process of improving the solution design. Second, theoretical expertise can also steer the design scientists' efforts toward fruitful theoretical insight. Finally, the theoretically oriented scientist can benefit from the possibility of actually taking part in the iterative innovation process instead of gathering information on the process after the fact with retrospective reports.

The common goal in design science research is that the researcher is interested in developing an artifact to solve a problem. Either the artifact or the problem, or both, must be novel. Without an explicit development of artifacts it would not be considered design science. Four phases of research describe the process of moving from new ideas to tested ideas to mid-range theory and, ultimately, formal theory. Contemporary research is dominated by the last two phases (theoretical science). Instead, the first two phases (design science) focuses on the generation of raw material and phenomena for the theoretical part.

According to the article (Groop, Ketokivi, Gupta, & Holmström, 2017), the starting point of any research effort should be that the practitioner's problem does not exist "out there", but rather, emerges as a result of a complex, iterative process of framing and design where the researcher plays a crucial part. Sometimes the assumption is that the nature of the problem and the objectives are priori known. But how problems become framed and which objectives become important is an essential part of any problem-solving process. That objectives must be established through explicit analysis, not by assumption.

In explanatory research, the phenomenon to be studied already exists out there, and the goal of the researcher is to develop an understanding of it. In exploratory research and design science, in contrast, the phenomenon must be created before it can be evaluated; the creation of artificial phenomena or simply artifacts is essential. The design scientist, while ultimately interested in explanation as well, is interested in creating an artifact that solves a practical problem.

From the point of view of knowledge creation, exploration and explanation research are not mutually exclusive; on the contrary, they are both essential and highly complementary. Exploration research complements explanation research by producing artifacts that can be used as raw material for evaluation research. Without design science, evaluative research would have nothing to evaluate. On the other hand, evaluative research complements exploration by evaluating the merits of various artifacts in different contexts.

Solving real-life problem focuses on the engineering of a solution as opposed to mere application of existing solutions to well-defined problems. What is exactly the problem? Where is the root cause? It is important to know that we do not discover problems as much as we construct them: we may discover a symptom, but the symptom is not the problem. Furthermore, any given problem can be framed in different ways, depending on the point of view of the researcher.

A limitation of the design theory in the article (Holmström, Giacomo, & Chaudhuri, Sustainability outcomes through direct digital manufacturing-based operational practices: A design theory approach , 2017) is that it proposes solutions that haven't been yet tested in the industry, so their outcomes that cannot yet be observed. The outcomes can only be anticipated; unintended and surprising outcomes are only revealed when the practice is reached, and companies are able to adopt the new practice. In this study, the situation is similar, as the outcomes of the solutions cannot yet be observed.

The research process in which the framing and solution design take place is best described using the CIMO logic found in the design science literature. CIMO logic describes what to do (Intervention), in which situation (Context), to produce what effect (Outcome) and offer some understanding of why this happens (Mechanisms). In most practice-performance studies, the relationship between the Intervention and the Mechanisms is taken as straightforward. However, there are two significant factors to consider. The first one is that every intervention has undesirable effects, meaning that some mechanisms are unpredictable and emergent. The second refers to the implementation, that does not necessarily trigger the desired mechanisms. Operational systems never react to interventions exactly how we had anticipated. Besides, implementation and mechanisms are sensitive to the context. The same intervention does not necessarily trigger the same mechanisms when the contexts are different.

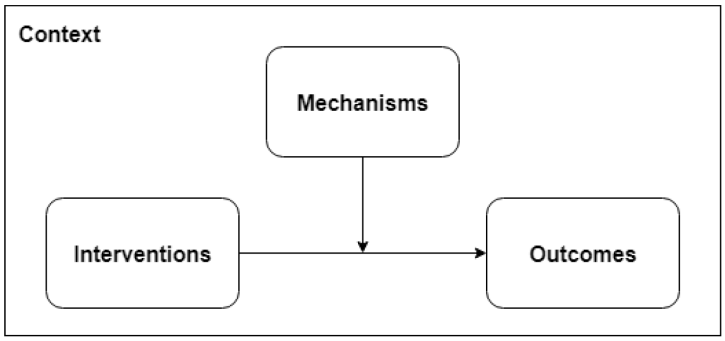

Figure 9. CIMO framework components

In the article (Groop, Ketokivi, Gupta, & Holmström, 2017) the sequence CMIO provides a better description of their research process. The emphasis at the beginning should be to understand how the system operates, what the undesirable effects are and what are causing them. This understanding is logically prior to trying to change it designing the interventions. In our case study, this logic makes sense, therefore we will use the same sequence:

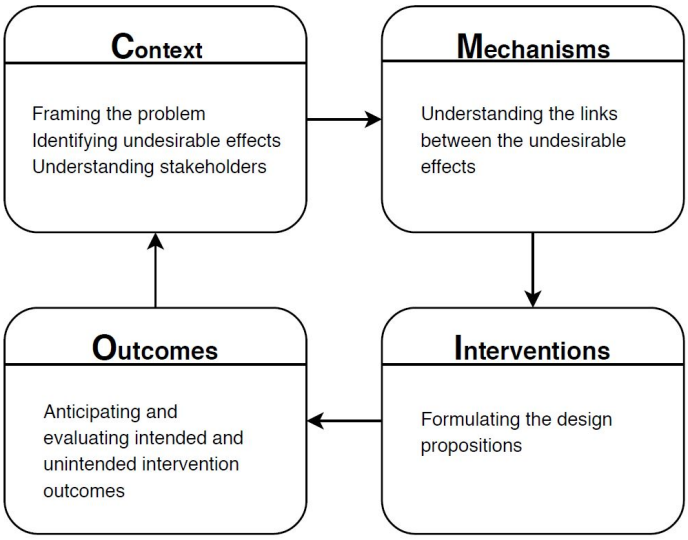

Figure 10. CMIO logic (Groop, Ketokivi, Gupta, & Holmström, 2017)

CIMO is only an abbreviation and does not presuppose or prescribe the specific sequence in which these activities occur. Indeed, an examination of the intertemporal aspects of these activities can lead to insight. Fig. 11 summarizes the research process that we use as the guiding framework, what includes all the steps that this study follows during the empirical analysis.

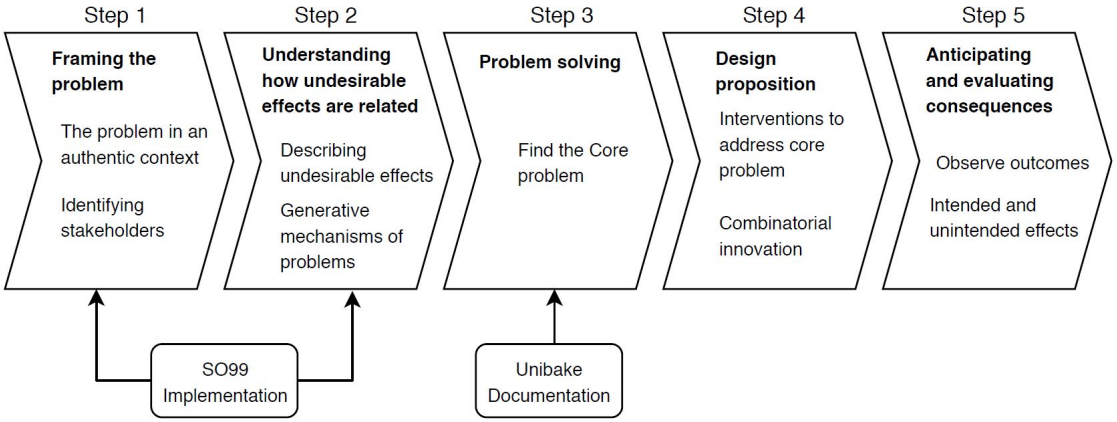

Figure 11. Research process modified from (Groop, Ketokivi, Gupta, & Holmström, 2017)

It is important to remember that the whole process and the solution design will be focus on the BP2.0 (Planning stream), while the analysis of the SO99 project is an essential input that support the first two steps: framing the problem and understanding possible undesirable effects and how they are related.

In the first phase we introduce Vaasan and Unibake context more in detail. This context includes the projects, in our case BP2.0 and SO99, that will have more prominence during the process. Besides, other projects that arose during the interviews are also presented. The stakeholder identification is also done for each project. All these definitions and analysis suppose an important basis on which to work in the following steps.

To understand what are the possible undesirable effects in the step 2, the main inputs are the interviews where different stakeholders from SO99 or BP2.0 transmitted us their experiences and learnings. The idea with SO99 is that if you see how they reacted in a similar environment, one can somehow predict what will happen in the future project and, from that perspective, observe potential critical factors.

Once we have those undesirable effects and their links, we know in which areas we should focus our solution design. But to check what possible gaps there will be in Vaasan BP2.0 implementation plan, we would need in depth information to successfully complete the step 3. For example, what templates or processes Unibake is planning to use in the Vaasan BP2.0. implementation. For that purpose, we had an additional workshop with a person responsible for Unibake Change Management where we asked questions about the critical topics that we identified in the interviews. Based on the interviewees needs and learnings and the templates sent by Unibake, we could see what is missing; what gaps there are between the project plan designed by Unibake and the real needs for the Vaasan BP2.0 implementation. Thereafter, observing common patterns among the different gaps, and thinking how to fill them, we could find the initially hidden core problem.

In the step 4, we know already the gaps where we can act, so we can develop some interventions or solutions to address the core problem in the Planning Stream. Finally, in the step 5 we reflect about intended and unintended outcomes that these solutions could trigger. As we have mentioned before, this thesis is prior to any solution implementation, so we can just try to anticipate possible outcomes.

3.2. Data collection

This research is conducted using qualitative research methods in a single-case study. The objective of qualitative research is to gain an in-depth understanding of certain behaviour and the reasons behind such behaviour. Instead of focusing only on what decisions are made, qualitative research examines why and how they are made (Kotiranta, 2012).

The most important source of data in this Master Thesis was the 15 interviews that were conducted with different stakeholders involved in the SO99 project or now in BP2.0. The interviews were semi-structured in nature; interview guides were loosely used since the objective was that the respondents choose what to emphasize on. In this way, the relevance of activities, phases and issues could be estimated depending on what the respondents decided to speak most about. A semi-structured interview lets the interviewee answer the questions in their own terms and lets the interviewer choose when to ask further questions to go in-depth with a topic (Idorn, 2008). Intentionally, in this method the interviewer become more a listener than an interrogator and only intervenes when something needs immediate explanation to better understanding. The intention is that the interviewee feels comfortable, like in a discussion rather than in a formal interview. The fact that the interview was supposed to be rather open-ended was communicated to the respondents early on, in order to avoid that the interviewee feel inhibited or stressed when answering the questions. Making sure that the interviewee knows what is expected of him or her is important from both a quality and ethical perspectives (Idorn, 2008).

The selection of the respondents and the schedule of the interviews was done with the help of the SO99 and BP2.0 Project Managers. A stakeholder approach was used to select different profiles and roles within both projects. A crucial aspect of empirically-rooted practical problems is that they always involve multiple stakeholders with only partially overlapping preferences; different individuals or groups see the project from different perspectives. Therefore, it is important to consider as much perspectives (end users, consultants, managers, etc.) as we can in our process. This is a fundamental initial step in the previously mentioned Design Thinking approach. Considering all these factors, the final lists of participants from both projects can be found below:

Code	Role	BP2.0	Date	Place	Duration
R01	Project Manager	Super User (Planning)	07.03.2018	Vaasan bakery	1h 30min
R02	Previous Project Manager	-	03.04.2018	Vaasan office	1h 15min
R03	Demand Planner (Finland)	Key User (Planning)	23.04.2018	Vaasan office	1h
R04	Demand Planner (Lithuania)	Key User (Planning)	11.04.2018	Skype	1h 15min
R05	Demand Planner (Latvia)	Key User (Planning)	10.04.2018	Skype	45min
R06	Master Planner (Vaasan Cluster)	Local Process Owner (Planning)	11.04.2018	Vaasan office	1h
R07	Implementation consultant (Optilon)	-	10.04.2018	Skype	1h

Table 2. SO99 project interviewees

Code	Role	Date	Place	Duration
R08	UBI BPM (Planning)	15.03.2018	Skype	1h
R09	UBI SO (Planning)	15.03.2018	Skype	1h 15min
R10	UB Finland Super User (Planning)	24.04.2018	UB bakery	1h
R11	Vaasan CFO & BP2.0 Steering Group member	12.03.2018	Vaasan office	45min
R12	Vaasan BP2.0. Project Manager	06.03.2018	Vaasan office	1h
R13	BP2.0 Fresh Build Project Manager	19.03.2018	Vaasan office	1h 30min
R14	Vaasan Sales Development Director	19.04.2018	Vaasan office	1h
R15	Vaasan Strategy & Portfolio Director	25.04.2018	Vaasan office	45min

Table 3. BP2.0 project interviewees

The data collection process was from March to April 2018 and each interview lasted between 45 minutes and 1 hour and 30 minutes. Most of the interviews were performed face-to-face with some exceptions when interview was made through video call in skype. In order for the interviewer to pay full attention to the respondents and to make sure all data was collected all the interviews were audio recorded. Interviews based on written rather than oral communication have been also used in the ERP literature (Esteves J. M., 2014), but that method does not fit with the design science approach because to understand people needs, the best way to do it is face-to-face. If even with Skype the interviewer misses important information, in a written-based interview the loss increases.

The previous literature review served as the basis to design a guide to the semi-structured interviews. We designed two guidelines or templates in total, one for each project, using the theme interview method (Smeds, 2010). Interview themes were selected to get a good overview of the informant's role and then to focus more on specific topics related to the project. The topics emerged mostly gathering common questions from the interviews of previous academic studies. These templates can be found in the appendices; Template 1 was used for interviews regarding SO99 and Template 2 for BP2.0 and they were sent beforehand to the interviewees.

As one can see in the templates, some topics are the same for both projects, but the main difference comes when we think about how to focus the interview. The interviewee of each group should understand clearly what kind of information we are looking for in each case. For instance, in SO99 interviews the focus was more in the learnings from that project, while in BP2.0. we were more interested to know about what Vaasan is doing or planning currently for the future implementation. The big and small "why" from the Unibake project model was used during the interview introduction to put the interviewee in context. The big "why" are the business reasons for the change and the small "why" is how it will change things on a smaller scale. In many cases, in the Critical Success Factors (CSFs) literature, they have used one part of the interviews to "force" the respondent to choose among several CSFs. Would not it be better if those factors arise naturally during the interview?

The full interviews were transcribed with the recording as source. Then, a 1-page memorandum was done for each interview, collecting the most relevant points that had been discussed during the interview. This allowed us to send these "memos" to the respondents with the objective of receiving their feedback about the points and new ideas. Furthermore, as agreed with the interviewees, only the information present in those memorandums would be the one that would be used for the thesis. The rest remains confidential. The use of memorandums has two great advantages: firstly, it helps to prepare the information that will be key to the subsequent analysis and, on the other hand, the fact that the interviewees have the opportunity to check the information that will be used eliminates possible misunderstandings.

Although the interviews are the main data source in this research, there are many other sources which have contributed during the process. Two different types of articles have been used with different purposes: ERP implementations articles are summarized in the literature review and Design Science articles have been the basis to introduce such approach in this thesis. Moreover, some articles related to ERP have been also used as part of our solutions in the empirical analysis chapter.

Another important data input was the introduction to the projects and initial training regarding the demand planning tool (SO99) and the current ERP (M3). It was part of the preparation for the interviews, and it was helpful to understand the context in which Vaasan is. Vaasan documents regarding Sales & Operations Planning (S&OP), SO99, evaluation reports from previous project, reports from visits to bakeries and BP2.0 were also shared by the company. Finally, Unibake BP2.0. documents have been a relevant source of information.

4. Empirical analysis and results

4.1. Framing the problem

An important characteristic of authentic problems is that they are always embedded in an institutional context that sets significant boundary conditions to the feasibility of solutions. These boundary conditions are an important reminder of the complexity of empirically-rooted managerial problems (Groop, Ketokivi, Gupta, & Holmström, 2017).

Now we are going to explain the context of the BP2.0 implementation in Vaasan, which is the "problem" or potential challenge that our solution proposals will address. Within such context, we have included two past Vaasan's projects (S&OP and SO99) that will be important in our process as well.

In 2013, Vaasan introduced for the first time in the company the use of Sales and Operations Planning (S&OP). The project objectives were to improve efficiency and support growth. S&OP is probably the least understood aspect of Manufacturing Planning and Control (MPC) systems. However, the payoffs from a well-designed and executed S&OP are large. It allows the company to link strategic goals to production and coordinates the various planning efforts in the business. If S&OP does not represent an integrated, cross functional plan, the business can fail to succeed in its markets (Jacobs, Berry, Whybark, & Vollmann, 2011).

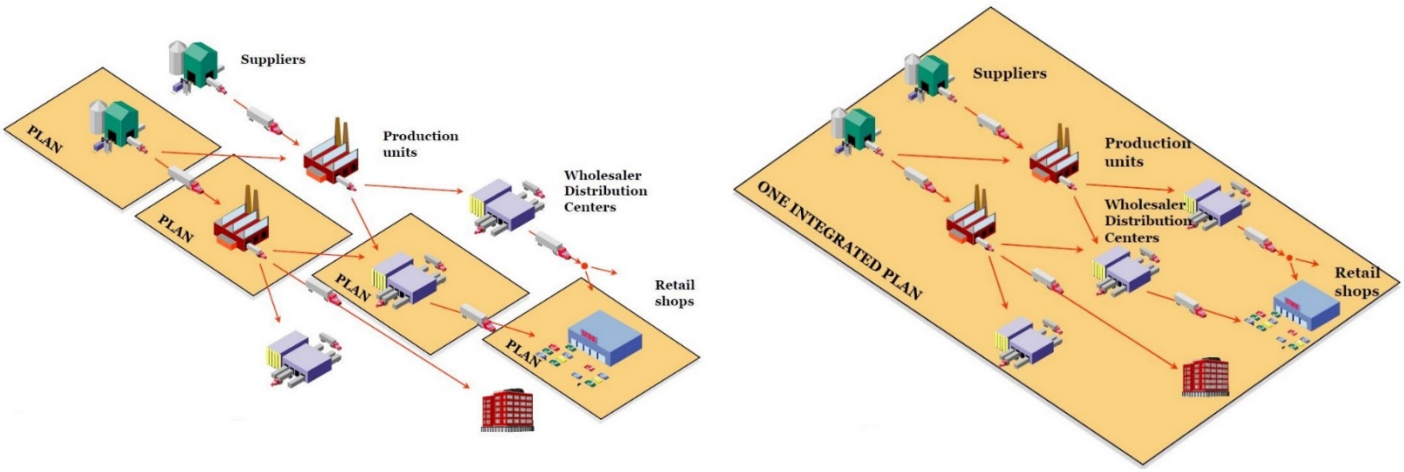

Figure 12. From separate and sub-optimized plans (left) to one integrated S&OP Plan (right)

At Vaasan, S&OP has become the backbone of their business, covering all their operations, to ensure they meet their strategic targets and the milestones on the way; they get better visibility. The backbone consists of three parts: first, how they are organized and how they lead; second, the tools and data they use and third, the processes and ways of working they apply. Without this backbone functioning smoothly, their daily operations could easily be a mess (Tuomikangas, 2017). Vaasan also reduced gradually its number of bakeries from 16 in 2014 to 9 in 2017. As a result, the production capacity has decreased but they have a much more efficient supply chain.

The change of Vaasan's forecasting software from IBM Cognos Planning to a more advanced and powerful one called Service Optimizer 99+ (SO99) in 2016, was also a big improvement within the MPC system. This new software allowed them to make more

accurate detailed long-term forecasts with less manual work than in the previous tool. Furthermore, the new tool gave them a lot of more visibility through clear charts. Cognos Planning was more purely numbers. For demand planners it was a great change because SO99 is an easy tool to use but it is complex to understand all the calculations and effect of inputs. During the transition, they faced some challenges that will be analysed as undesirable effects and from which we will try to capture useful learnings.

The phases established by the consultancy methodology in the SO99 project were: first the design of the system and data introduction; second, execution when the model is ready and finally, support and maintenance. The initial plan was to run first the monthly forecasts and the daily part was left to the next stage. But monthly took more time than expected and as a consequence daily was delayed as well. When it was time to start with the daily part, the tool was not able to calculate the daily level baseline with enough accuracy. They underestimated the complexity of the daily forecasts. This problem is being solved through upgrades to the tool by ToolsGroup (owner of the software) and development of internal processes and inputs.

In a daily level, manual detailed planning with excels has been the main tool that the company has used to survive in the past. This is core for the business because they produce fresh bread (perishable) and they are totally dependent on a reliable daily forecast; basically, they produce only based on forecasts. Although SO99 allocates monthly forecast down to days, they are still using the excels to create the daily forecasts. At the same time, they are working to improve the accuracy of daily forecast in SO99 to complete the project and start using SO99 for daily level as well. Currently in all countries monthly and daily forecasts are not linked (figure 13) and in each country they use their own daily solution.

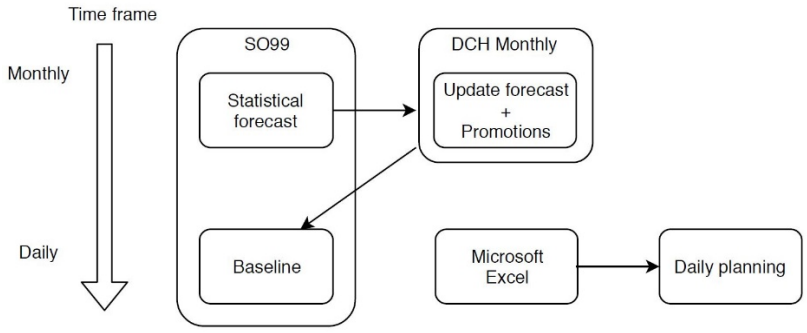

Figure 13. Current situation in planning

ToolsGroup's Demand Collaboration Hub (DCH) is a consensus building platform that complements demand forecasting by bringing together data from multiple stakeholders. The net result is a single consensus forecast, minimizing inter-departmental differences and quickly improving forecast accuracy (ToolsGroup, 2018). The forecasting solution in SO99 project was designed so that SO99 statistically forecasts demand without promotions; those promotions are then added manually on top. When they update the forecasts in Baltics, they use a lot of manual overrides to modify the statistical forecasts. In addition, those markets are different, and they work with much more promotions than in Finland, so they need more manual work. Instead of the manual overrides, SO99 should

be given enough information about the demand such as historical promotions and changes in listings so it can create an accurate statistical forecast.

Simulation and planning are becoming more and more important due to the digitalization trend and companies should understand that the excel sheet doesn't work well anymore as they don't reflect real time information. The use of excel brings different problems: no visibility of plans or current state, difficult to replanning and change management, no tracking planned vs actuals (more firefighting than real planning). This has effect on the production efficiency.

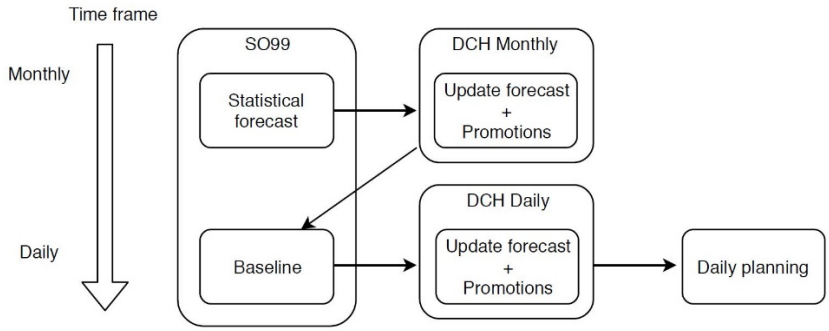

Figure 14. Future situation in Planning

In the desire future state, SO99 will break down the monthly level forecast into daily using the sales profiles and this baseline will be used for daily planning. Statistical forecasts created by SO99, with enough and quality inputs, are more accurate and easier to maintain than manual overrides. When they finish the configuration of the system to use it on a daily basis, this will allow them to stop using traditional excels.

The main implication is that before they have been working without any link between short term (excels) and long term (SO99). In the new integrated system, it will be necessary to have a really good level of monthly forecast accuracy to be able to add also daily. In some countries there is still a big room for improvement in monthly before they are prepared to run daily. It takes a lot of time.

Definitely, the biggest change is coming in Vaasan with BP2.0. As we explained in the introduction, it is not only an ERP implementation, it also includes processes standardization and data harmonization. One of the biggest "why" for this change is that globalization call for standardization; to remain competitive in the future, there is a need for integration at all levels in order to improve company's agility and efficiency. The new standardized ERP across countries will cut a lot of costs, have easier maintenance, more visibility and common reporting. Basically, it allows to centralize the governance. That means also that the level of independence both at individual and company level will decrease.

Lantmännen Unibake produces frozen and fresh products and the difference between them is important to consider during this analysis because they are considered two separate businesses. Basically, in the fresh business a product is delivered right after its production while in frozen it is stored. Then, for fresh businesses the importance of daily forecasts is much greater, and they have less time to react. BP2.0. implementations started in 2017 in United Kingdom and Finland, both frozen businesses. During the interviews,

it was very valuable to ask about these previous experiences to **R08, R09** and **R10** in an attempt to learn from them as well. The plan this year is to implement BP2.0 in Sweden (frozen) and in Denmark, that would be the first fresh implementation project. But before the Denmark implementation, there have been a previous project called "Build" to adapt the processes and system solutions, which were initially designed for the frozen business, to the fresh business. It consisted of a gap analysis comparing with the frozen processes and huge part of the requirements discovered were at local level, so they were left until each local implementation. The project hasn't been easy, and it has taken a lot of time and resources, but it is the basis for all the fresh implementations, so its importance is capital for a successful implementation. This project is now almost completed.

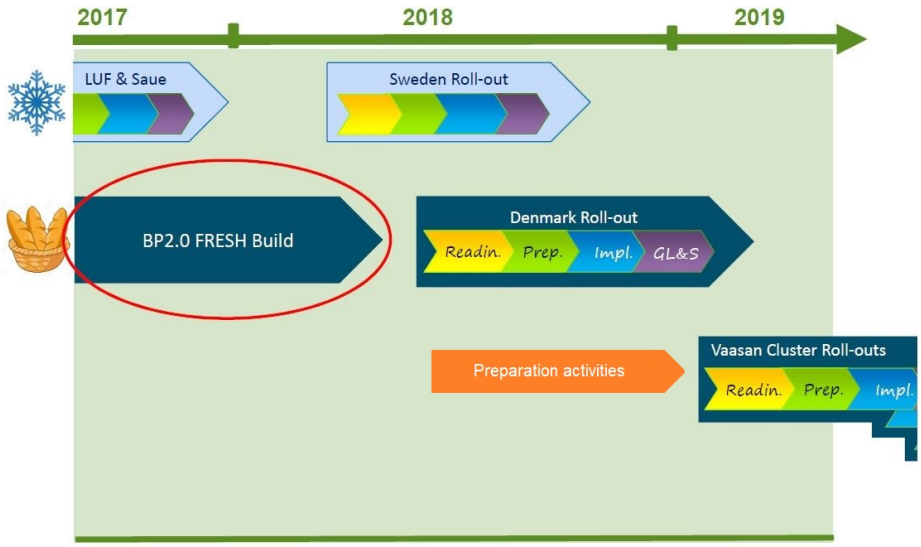

Figure 15. BP2.0. programme timelines

The central organization have built the fresh business adaptation over an existing frozen solution, and they are still in a learning curve to understand the differences, because they don't have so much previous experience with the fresh business. Besides, the objective was to change the existing platform as little as possible to keep the high level of standardization and ensure benefits from it.

In the frozen business they used the previous version of Microsoft Dynamics AX but in fresh they have to migrate from a totally different system (M3), so it will be a bigger change. They will have to change the way of working but with the speed of the fresh business. In Vaasan they have now local and customized ERP solutions in each country, therefore, they are missing the most important advantages of an ERP: its integrated nature to provide a cluster view. The M3 version that they are using is old, not really user-friendly and it has already lack of support.

The business context is a big obstacle in Vaasan implementation, where they are part of a big company that is currently doing a large implementation across many countries and it is very difficult to understand their roles and responsibilities. It is a long path until some decisions became true in a huge group. The Fresh Build project has been mostly driven by the central project team located in Denmark and Vaasan's power of decision has been limited. Moreover, Vaasan has 4 countries and 9 bakeries, what means a great variety in capabilities, cultures and languages. This adds a lot of complexity. All the people in

Vaasan have been using the current ERP for so many years and they now must change their mindset completely to a process driven way of working. They will face situations where something will work, but not as effective as they work today, so they must understand the business risks. The key is to find the balance, because although the company may miss some features, they can also gain ones that are missing. BP2.0 will affect everyone in the company. People need to understand the big picture: this is a huge project and delays are common. It has a long-life cycle for individuals and it is an opportunity for them to learn new things and progress in their careers.

Super Users (SU) will be driving the preparation activities for all the streams in Vaasan cluster during 2018 and at the beginning of 2019, it will be Vaasan's turn to start with the implementation. Vaasan need to be proactive, being in close contact with UB, where they have already had the implementation. Then they can learn about critical changes or recognize critical areas to start making important decisions. The four phases defined in the project plan by Unibake are readiness, preparation, implementation and go-live and support. In the readiness phase (4-5 weeks), the scope, plans and business readiness are approved. The preparation (8-12 weeks) includes the completed trainings for Super Users and the approved training plan for end-users. For the implementation (8-11 weeks), the training should be completed for end-users and the User Acceptance Testing (UAT). Finally, the Go Live (4-6 weeks) close down old systems and launches the new ones and start with the service support. The proposed timing will be different for Vaasan because the situation is particular, as mentioned before, and for that reason they will need more time. The idea is that in Vaasan cluster all the countries will run the three first phases together, but the Go-Live will be country by country with a month of difference. More details about the project organization and roles can be found below:

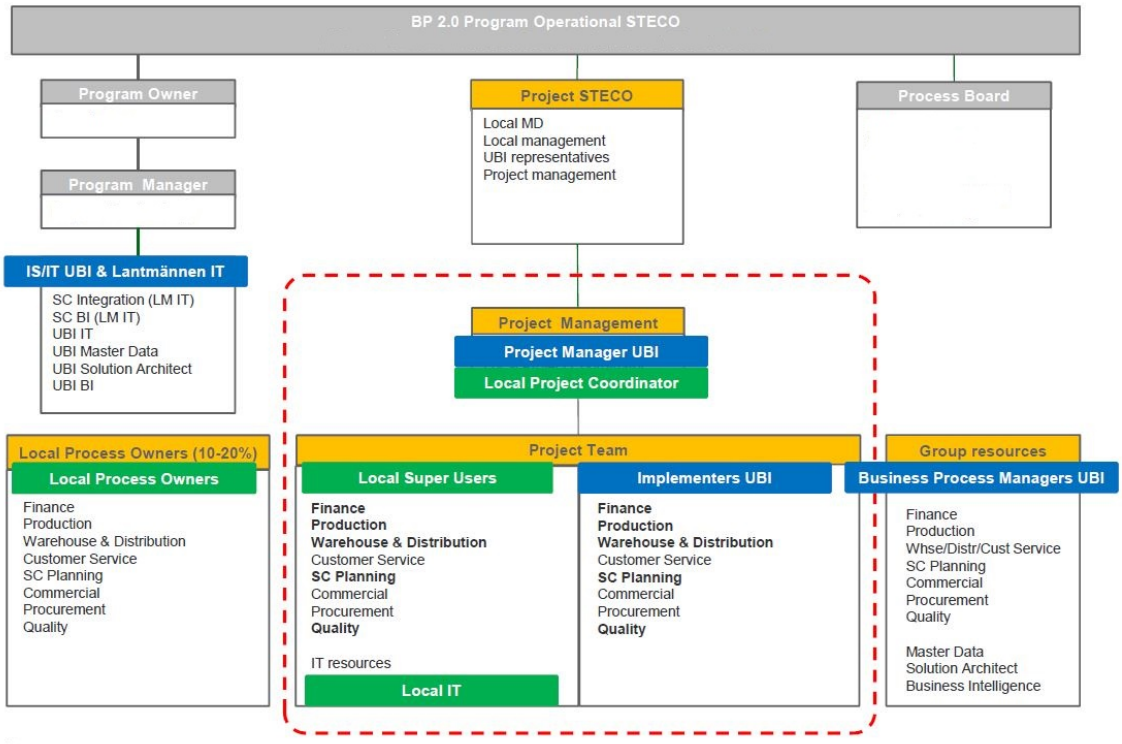

Figure 16. Team for BP2.0. implementation

The Local Project Coordinator (LPC) is responsible for the management of the local project members and main tasks linked to training, data preparation/conversion and cut-over as well as verifying and documenting all local requirements. The LPC works closely with the Project Manager (PM) from UBI. In Change Management areas like training and communication, the LPC will work together with the Change Manager from UBI.

A Super User (SU) is a frequent user of the operational business processes and the systems enabling these processes. During the project, the SU will team up with the implementers and BPMs and are engaged in implementing the new standards and enhancements in BP2.0. in the local organization. An organization with many end users and/or several sites, just like Vaasan, will preferably have additional supporting SU (Key Users).

The SU is assigned for each functional area in the project and will become a proficient counterpart for the Business Process Managers (BPM) and Local Process Owners (LPO). The SU participates in fit/gap analysis and provides training for the local end users within the specific functional area. For questions/issues during the project, the SU is supported by the BPM and LPO. The SU role is taken on in the project but is ongoing/permanent and will continue with changed responsibilities post Go Live.

The LPO is overall accountable for the main business process within the functional area in the unit. The LPO is normally, but not always, the SU's manager and works in close collaboration with the BPM implementing the new standards and enhancements in BP2.0 in the local organization. The estimated allocation to project work is 10-20 % (average).

The local Steering Committee (STECO) supports the project with guidance and decision making for the project to success within time, budget and scope. The local STECO takes the formal decision for an existing project phase and entering the next. The Go Live date is set by the local STECO.

In Vaasan cluster they are now reviewing the BP2.0 team structure for 2018, in order to be aligned for the implementation starting in early 2019.

4.2. Understanding how undesirable effects are related

Once the problem has been framed, the next step in the analysis is to gather and describe all the Undesirable Effects (UDEs) based predominantly on the stakeholder answers in the interviews. These UDEs suggest inefficiencies in the planning stream during the SO99 project and reflect about possible threats in the future Vaasan BP2.0 implementation. In addition, we have two interviewees (**R14** and **R15**) who have contributed their experience in the S&OP project. But the interviews weren't the only source of information, as it was mentioned in the methodology, additional reports/evaluations from other projects (Joutseno and K2) have been used as well.

The first evaluation of the UDEs was done selecting them for the memorandums as the most relevant points or findings from the interview transcripts. Then, analysing the memos more in depth during one workshop we realised that all the UDEs belonged to four broad groups (Training Plan, Resources Management, Communication & Coordination and Change Management), so each UDE was classified and included in one of these groups. This classification will be developed in more detail in this chapter (note: all the points from the memorandums are written from the perspective of the interviewer).

Training Plan	Resources Management
Not enough on-hands trainings	Competences/skills issues
Missing “What if” answers	Role and responsibilities not so clear
Need for report per user (evaluation)	Changes in the organization structure
Not enough repetition	Steering Group high level
Focus on the system, no processes	Local support from the beginning
Different languages	Not enough resources (risk of overload)
Not enough time for trainings and trainers	Underestimate Master Data
Lack of support after go-live	Resources changes
Key User training needs	Need for more consultancy guidance
Difficult terminology	Initial plan not realistic
Knowledge gap	Dependent of the external consultants
Not commercial involvement	Risk of receiving external resources
Communication & Coordination	**Change Management**
Lack of communication from PM	Not enough visibility: uncertainty
Big project: delays	Too high expectations (not aligned)
Projects not coordinated	Not enough commitment
Missing processes mistake instructions	Different goals locally
Actions time and quality	Stakeholder late involvement
Complexity Baltics (promotions)	Resistance to change: dependency
Video conferences barriers	Misunderstanding program goal
Inefficient physical meetings	Already late with preparation
No questions during meetings	Next phase without finish previous
Difficult to follow up emails	Stress so high
Poor collaboration and info sharing	Frequent Risk Management
Don’t understand the size of the change	Underestimate Shop Floor

Table 4. Summary of interviews UDEs

At this point, it is important to avoid drawing conclusions about underlying causes: UDEs are symptoms, not causes. It is necessary to identify them, because they ultimately provide insight on what kinds of interventions are likely more effective than others. UDEs are also not defined once and for all, the list can be modified based on the findings that occur later.

4.2.1. Training Plan

When you talk about trainings it is very important that you can use the tool. In SO99 project they had problems with the licenses, so the trainings were more showing or

presenting something done with SO99, but not on-hands trainings. In that sense, above all at the beginning, the trainings were a bit poor. During SO99 project training they had face to face meetings for monthly where she is afraid that probably everyone didn't understand maybe because they didn't have the opportunity to use the tool [**R06**].

What was missing in the daily planning phases was that the steps were clear but they would have needed "what if" answers to face problems more easily. He basically learned to use the tool (SO99) by using it on his own, finding problems, and asking questions. He insisted on the importance of working yourself after the training. It was highlighted that learning with the facilitator is better than extensive material in the desk that maybe you never read. An important question is until what level of detail you should go down in the training materials. In this kind of software, at the beginning you feel that you don't understand nothing, but after few weeks, you realise that you can use it [**R01**].

For the end users they learn most of it when they do the work. They will have also trainings, but few hours. The key will be to support them after the go-live. Then, it will be when they really learn. She thinks that they should check that everybody has the training and they understand (report per user). They definitely need to adapt the training plan, for Vaasan it will be more centralized for the Super User and locally for key users [**R13**]. The trainings, how it works, they have 2 or 3 sessions in the same topic for the end users to have enough repitition [**R08**]. If you are an end user is enough if you understand your own part and how that part influence next steps. But Super Users are expected to understand everything from their area and the connections with other areas [**R11**].

During the implementation typically people is more focus on the system (data set up, new features) than learning the processes. Probably that could be a learning that they can use for future implementations [**R08**].

Language is one key thing in the trainings. They tried to have the training together with Estonia, but they realised that the English level was not that strong. Training in the own language with presence on site is the most efficient way of training. For example, they have translated some DPIs in the factories and she doesn't know if they are written for end users because in many cases they rewrote them [**R10**].

It is important that you have enough resources, who can do the trainings for end users. Based on previous projects and looking at the magnitude of BP2.0, it's about scheduling enough time for the trainings and also to ensure that the trainers have time for that [**R14**]. They started the Master Data too late and it took a lot of time. That's the most important thing because if you don't have data you cannot test or train. So, you need the data as soon as possible [**R10**].

A key challenge today is that everyone is so busy so then people think that 2 hours training is enough, but from previous experience she said that is necessary full days for several months because it takes time before you are fluent with the system. The trainings should be as real as possible and systematic. Everyone should know what happen before and after their processes and how to fix problems [**R15**].

Training is very important but still after go-live, to organize the support. It doesn't finish there, it is just the starting point. She recommends having somebody in each country (key

user), otherwise the SU cannot be in some places at the same time. The Planning Stream is particularly complex area because it is in contact with a lot of other departments [**R10**]. They should have included more sales people in the project to consider their expectations, risks, etc. The commercial part was missing [**R05**].

They had some issues like language and they didn't understand everything that the consultant (Sonja) was saying with professional terminology (maybe she assumed that they were understanding). She highlights a big knowledge gap between Vaasan employees and the consultant [**R06**]. In every training session they had someone online, and it was difficult to see if they understood or not. The training method was ok, but the problem was that there were planners at very different levels. She didn't know the planners beforehand, so she didn't know their level, maybe it would have been a good idea to interview and involve them earlier also with the suppliers [**R02**].

It is not only important the questions that different members ask you during the training sessions, it is also key to hear them after the meetings because maybe they didn't want to share that with other many people in the same room [**R07**]. Face to face conversations at least at the beginning is always better. After the meetings it was important for him to have the possibility to ask private questions [**R05**].

A positive point with the consultant was that she was Finnish, and it helps to train or support in your own language. The language has a big effect. They sent one of the capable planners from Estonia to other Baltics, but it was difficult for them to ask. Maybe they had too much to do or they didn't know each other from previous meetings. It would be better more teamwork. For example, in the preparation phase, IT and planners were quite separate [**R02**].

They haven't had any high-level trainings for the management, but it would be very good. It shouldn't be very detail but somehow through the process flows. It is difficult to support your organization if you don't have the proper picture [**R15**].

The initial idea is that Vaasan could start, in this time before the implementation, going to some of the cross-functional workshops in Denmark. But now she is not sure about the benefits due to the fast implementation method [**R08**]. Some of Vaasan's Super User will also be involved in the Denmark implementation but she has to see where they can be or where not, because at the same time they have a huge project to run [**R13**].

4.2.2. Resources Management

This will be a lot about competences. People will have to learn how to work as a process and to understand what is your part in the whole process. The new ERP will require more skills. They need to find people with enough skills to handle the system [**R11**]. The planners had to change completely their way of working, they underestimated the size of the change from the beginning. SO99 really required much more knowledge and skills and there were planners not capable enough. It would be a good idea to map the user's levels at the beginning and use it during the project [**R02**].

They have found competences issues in previous implementations with people who have been working with excel sheets for many years. The training gap is big [**R08**]. They should be honest with themselves and think if their current planners have the capabilities

to run the system because if they close their eyes then they might have a very bad situation when the production starts. They have to evaluate that during the trainings [**R15**].

Regarding the resources that participate in an international project based on their current roles and responsibilities, everyone might not have the language and presentation skills that you'd need. Maybe in the offices you don't have that problem, but when you go to the "floor level" and some supporting functions, it will be more challening to deal with that. So, if you overestimate people's language skills, e.g. in reading the manuals and instructions, there might be problems that slow the implementation [**R14**].

It was a risk to mix quite ambitious goals like try to make the planners role bigger with a software implementation at the same time [**R02**]. The role and goals weren't so clear from the beginning but his experience with demand planning tool helped him during the adaptation [**R01**].

Super Users will be the key people, they will train the end users. So, they need to understand everything in detail. For that reason, they start early and they need enough repetition [**R13**]. She highlights the importance of people, especially Super Users. It will be key to have the right people in those positions [**R11**]. The objective is that the people that they are training (Super Users) in the future can participate in other implementations [**R09**].

In the fresh business they will need to add Key Users quickly because for the go-live they will need a lot of hands. They will be close to the end users [**R13**]. The time is not enough for one person in each stream (Super Users) to train everyone. Key Users will help them locally also to deal with language challenges. A key point will be to keep communication going when the Super Users are from different sites. Languages and distances are crucial [**R08**]. Vaasan will need also Local Project Managers to help the LPC, and Super Users with good English skills to avoid language obstacles across countries. They will also Key Users in each bakery to support closely the end users [**R11**].

It might have some kind of effect in the organization structure, but they don't know yet. The new processes will be the big cultural change. They also have to learn how to work with Unibake because until now they have had their own resources and independency but after BP2.0 it won't be the same [**R11**]. In the Steering Group the people were too high level, so they didn't give her so much comments about the problems. If she does it again, she would take the Steering Group more lower level, some people that understand the daily process better, people from other countries with more commitment locally [**R02**].

She doesn't think there was enough support from the local organization from the beginning. After go-live, Vaasan (Finland) started involving managers locally in other countries. At least, they should know for what purpose you are using their resources [**R07**].

They need to be sure that they have enough resources to support locally all the bakeries when they go live. Thinking about SO99, it would be great if they have some more local support. In a cluster level, it is very important to make the decisions together [**R06**]. In a project you need dedicated enough and right resources, doing the right things. In the build project they were borrowing resources from the implementation projects and that had not a good effect. They would have needed more flexibility with the teams [**R13**].

The Unibake BP2.0 landscape has only 1 Master Data person, and this person is involved in all BP2.0 related projects (i.e Frozen roll-outs, Fresh Build and future roll-outs, Quality projects etc). As this person is extremly busy, it is difficult to get her attention. Also there is no visibility of the overall MD plan. In all implementations so far, Master Data has been highlighted as one of the big risk areas [**R12**]. In many cases people are a bit complacent about Master Data. If they don't put it systematically, they don't know how much they have or what is its quality. People underestimate the time that is requires to retrieve this information [**R08**].

Usually when you don't have enough resources, you have to reduce the scope. The initial idea was that Estonia and Finland go live at the same time, but they didn't have enough people to do that, so it was delayed 1 month [**R10**]. Make sure that people can provide the expected hours in the project and still have time for their daily work. It is part of the management to see if they have enough resources [**R09**].

It is not all the time that the project plan allows time for reflection. So even though you know what you should do, but when the project starts everyone is so busy (risk of overload), which means that they don't have time to stop and reflect. This is a big risk in the project, and wrong decisions can be taken and influence the project [**R09**].

It is not easy to deal with continuous resources changes in other countries because every time that a new person start is slower at the beginning. It would be important if they can identify and update this kind of risks in order to avoid surprises in the future [**R06**]. There are new people in Vaasan managing the project, but when you go to the end users, they have been there for a long time [**R13**]. They are now concentrated to finalise the Super User selection and structure. Then, they can start to look at the organization level. For example, what new people they will need [**R11**]. There were a lot of resources changes, which was difficult to manage during the the implementation. Besides, one of the challenges is that this is not the primary job of all the users, they have to do much more things so they would have need more time to participate in the project. For that reason, this kind of projects need a clear structure internally [**R07**].

He would have needed more guidance from the consultancy because in daily forecasting is a completely new way of working [**R01**]. At some points, the consultancy didn't listen to them, so they didn't understand Vaasan environment: skill level of their demand planning and how many of them they had. The original time plan was too short because they thought that it would be easier than it was They missed some small details at the beginning when they were discussing with Optilon. Thereafter, it took a lot of time to define them [**R02**].

What was not good is that we became quickly dependent of this consultant, they couldn't do much things themselves. Some planners felt that the consultancy fixed the problems, but they didn't learn what they should do if the same thing happens again [**R02**]. They should try to have internal experts in their system during the project in order to not be dependent anymore on consultants [**R15**].

All UB Solution owners were put in UK project. In Finland, they got almost only consultants. The consultant knew the system a lot but not so much about UB. It took a lot of time to explain them the company environment. Solution owners from UB know more

practical things and defend actively the change requests. This situation caused problems in a later stage when they got solution owners from UB because they had to discuss again the same points because they were not ok. Another problem was in the support after go-live in Finland because they were more focus on Estonia [**R10**]. There is a risk in receiving frozen consultants and project team (from Sweden) doing their first fresh implementation [**R12**]. There is a risk in the project if development is outsourced during a project, because they don't know the business that well in the beginning and it can be difficult to understand how they work due to cultural differences. It is a learning process for everyone [**R09**].

He feels that a succesful implementation requires some stability in the use of implementation consultants, and it can be a big risk if resources are swapped around projects. It can reduce transfer knowledging between consultants and delay the implementation. Stability is important when you do onboarding of external people in a project [**R09**].

4.2.3. Communication & Coordination

Regarding BP2.0, there is some lack of communication from the project management to the countries that participate, the country organizations don't know where they are at the moment in the planning. The intensity of the communication should increase even though the project management might be busy. The overall schedule of BP2.0 regarding all of the countries has been a bit too optimistic, and they've already had to reschedule the roll out plan. It could be slightly frustrating for the already nominated project personnel, if they have to wait a lot until the project really start [**R14**].

They are trying to encourage Super Users to do information sessions with their respective streams. But they shouldn't give them too much accurate information, it is just to keep them informed about the program, who is involved and how, etc. So, when the implementation starts the end users don't feel that they come from the sky [**R08**]. The project team should concentrate only in the project and communicate as much as they can with the end users, trying to keep them involved [**R10**].

If we talk about end users, they need to focus the communication on the top end users (office). It is different with the end users in the shop floor, they don't need to inform them at the same level. It is good to communicate, but the downside of that is that this is a big program and not everything has been going as planned [**R13**]. The end users don't always know who the correct person is to ask the questions. One Super User doesn't know everything in detail. It is better to have someone locally to support end users. Usually questions are related to when something has gone wrong, so they learnt that they only had in the processes instructions the scenarios when things go right, but what can they do if they do something wrong? [**R10**].

It's very important to empower and involve people from the beginning of the project. In addition to keeping just the key persons informed it's better to communicate directly with most of the people involved, because there is always the possibility for misunderstandings in indirect communication [**R14**].

There are some projects (e.g. Quality related), which are not directly within the Fresh BP2.0 project scope, but run in parallel with their own milestones and deadlines. At times this causes confusion, as the projects are not coordinated [**R12**].

In all the meetings the Baltics were always involved at least through skype, that was the way of coordinating the project. The problem was that the actions took more time than they should have taken, and he is not sure about the quality. He didn't know if all the countries understood well the checkpoints relevance [**R01**]. The coordination in Baltics have been more challenging in sales related projects, because they have had a lot of changes in their organizations (thinner than in Finland). In addition, in some cases they have multiple responsibilities, and also the structure and the dynamics of their customers is different. So, it is about the complexity of the business in the Baltics [**R14**].

At the beginning, they had some sessions through video conference with Optilon to know the system and where is going to affect and it was quite hard to understand what they were talking about. She thinks they should have been in the same room and discuss more together, at least in the beginning. Through video it wasn't so easy to ask, it was more sitting there and seeing what they are showing. She agrees that both methods are needed but the key is to find the right balance [**R03**]. Skype is not good in general, just for basic things. In the project they had info letters every month, but she doesn't know how effective those were [**R10**].

Previously in Vaasan Fresh cluster there have been some gaps in sales related processes between Baltics and Finland, but we have continuously been developing a common way of working. We have been using a lot of video conferences, but they are a bit more challenging when you develop processes; one needs to have a good, active dialog, which sometimes is difficult in video conferences. It is always better to have actual face-to-face meetings and workshops, and although there are small obstacles like calendars and travelling expenses, the results are much better in face-to-face workshops [**R14**].

During the workshops, many people from other countries came up with an excuse not to travel. Sonja thinks that one of the biggest learnings from this project is the importance of being present in the meetings. Actually, they changed their initial plan (only meetings in Finland) and they had a meeting in each country, which was good for the project because you know the other people in their local organization. In the design phase they had to re-do things multiple times due to not having all the stakeholders in the same table at the beginning (missing their comments) [**R07**].

In one of her previous projects, one success factor was that the planners were in the same room. A key element is that they have to spend a lot of time physically together. They shouldn't be saving in travel costs because if they have problems in planning the financial impact would be bigger [**R15**].

In the workshops or meetings would be a good idea to have starting points for the issues. If you know them before hand can help you to prepare the meeting or at least to know what will be the topics [**R03**]. At the beginning of the project, she feels that they dedicated a lot of time for details instead of for important things. The common meeting could be used in a more efficient way preparing what need to be discussed (clear topics). In the meetings, they spent a lot of time deciding which country needs what and it was based on

the importance. Most of the time they were speaking about Finland because they had the priority but the other countries also need things. This was a bit discouraging sometimes [**R04**].

She was in Denmark for the presentation of BP2.0 AX program and there were no questions during the meeting. It was adviced to write a email with questions. Why not to use that time also for questions? Sometimes it is important that some people have ideas and start a useful discussion with the rest. SO99 workshops was based on discussions. More unforeseen challenges were raised [**R04**].

At a cluster level, if a change is done in one place, it should be documented to know which person or which country decided on doing what and what time. They had an email always after the meeting saying what was decided there but it is difficult to follow up them. It would be better a timeline (or something more visual) like action log. All the information in one place where people can check with more visibility and quicker. This can help also for the adaptation of new people that join the project later [**R04**].

She considers that they didn't have enough information sharing regarding problems, because sometimes the same question that they asked before to the Project Manager, next week another country asked the same [**R04**]. He feels that Latvia have lack of information about BP2.0 and that was different in SO99. He doesn't have the same level of understanding, maybe it is just the beginning, but he would prefer to know something more [**R05**].

They are now starting in Vaasan a common forum for the demand planners among countries and there wasn't a structure like that before this project. This is very valuable. The best persons to learn from are your colleagues. In this sense, maybe internally there was some collaboration missing [**R07**].

It is very important to have a clear implementation strategy for each country, that support the overall roll-out plan. All of them should be considered as important stakeholders during the roll-out. They should be involved in the project from an early stage in order to show potential differences in set up and support the intercompany processes. An open communication is needed with all the stakeholders identified at the beginning. You need to analyse who to inform and how. There are even people not directly involved, but they need to know what's going on and the aim for it. For example, in Denmark there was a good initiative to put some screens in the canteen and shop floors with videos about BP2.0 [**R09**].

In Denmark they have screens with videos in Danish about BP2.0. She also did an internal communication in other company (similar project) where they started early to send emails with pictures comparing the previous system with the new one, just to prepare the people for the change. She thinks that they are not good as they should in communication and they could adapt something like that for improving it [**R13**].

4.2.4. Change Management

Successful projects can only occur if implementation is going along with a change management plan, that prepare and mature the organization for the transition of the old way of working to a new agile way of working with a new ERP system [**R09**]. In change

projects, companies are often expecting visible results even in a few months' time, but fundamental changes inevitably take more time to root [**R15**]. Change management can help breaking the cultural barriers and establishing a realistic speed for the implementation [**R09**].

It is important for everyone in the project to understand that standardization is not necessarily link to software implementation. Convince people that standardization is key without any software [**R02**]. It was important for standardization the process evaluation. They came up with different points to develop. The management support was so effective, but it would be better if they understand the reasons for the change. That's for him a key role of management commitment [**R01**].

From the beginning, there weren't enough commitment. The process evaluation was good because it helped to open people eyes in the project [**R06**]. She says that is important the role of Project Management commitment to reach the deadlines and encourage participation in the meetings [**R07**].

The leadership is the main thing, someone who take the responsibility. It is important to have a clear timetable to know what they are going to do and when. Be sure that the people can do what is planned on time (realistic) and it shouldn't be so flexible, less in a project in which deadlines in different countries are connected [**R03**].

A big reason for not adapting to the new tool easily was that in Vaasan HQ they had different goals than locally. To solve this maybe is good to involve them earlier and tell them what they want they do and why. You should motivate management locally [**R02**]. Resistance to change was due to not wanting to leave their high level of indenpendency or power to decide over the system [**R07**] For sure some people won't want to change, you need to admit that. In that case, it is important to identify them because if they stay long they will create resistance to change [**R13**].

In SO99, she understood that at first, there was a big misunderstanding on what the SO99 program would be for. She was not sure about who will be using the program and why they need it. This is a learning for the future, to know well what the role of the tool will be and who will be using it [**R04**]. The initial plan for the daily was not realistic [**R01**].

It is challenging to plan the future exactly, when you do something really new. You need to be realistic in scheduling and accept that there might be some changes. You need to be prepared to act accordingly and be ready to be flexible in the project. One of the risks is the scheduling of the project. The schedule might look good on the paper in the planning phase, but one should always take into schedule enough time for reaching different milestones. Even in smaller projects one has sometimes seen that it has been difficult to make realistic project plans. Regarding BP2.0, this risk will be multiplied, as there are much more people and processes in several countries [**R14**].

It has been challenging to get the Denmark progress, and this cause problems because they need to allocate a lot of people, but they don't have enough visibility. It would be also important to communicate what's going to happen in the future [**R15**].

From Vaasan point of view, they are already late with the preparation of BP2.0. For example, they have realised that not everyone can communicate in English and also that

they only have few people that really understand the processes [**R06**]. They have a long list for the BP2.0 preparation in Vaasan but they already know that they don't have time to do all. The focus is on the points with more risk where they can benefit from pre-work [**R11**]. She would start changing a bit their current ways of working in order to be as close as possible to the new ERP (progressive change) [**R08**].

The information now in BP2.0 is only in the high level, when you go to the people that actually will use more the system they feel this sometimes like a panic thing because of uncertainty. There should be some informative messages reflecting about what is coming, why and when. It would be better if the people know that it will take a lot of time and extra effort, they need to be mentally prepared [**R04**].

The focus should be on Change Management, communicating why and how they are doing what. It is important to listen to the people and try to give them clear tasks. If you want to keep them involved, the best way is to give them a significant role from the beginning. She proposes to celebrate when they finish important milestones [**R15**].

When you start this type of standardization projects is very important to have your expectations aligned. Open minded to adapt yourself to the solution in order to maintain the standardized set up as much as possible. You have to try to do an effort to keep people on board, they have to understand what do you really want and how they can benefit from the new platform. People should know their roles in the project and what's expected from them [**R09**].

What they saw in previous implementations was that there was tendency to continue into the next phase without signing off on activities from previous phases. You shouldn't go to the next phase unless you have finished and revised all the activities that they are doing in the current phase. If not, you will have a snowball with a long list of unfinished tasks [**R09**]. In the Conference Room Pilot 2, the project management didn't want to delay the meeting although they didn't have everything ready to show the fresh solution. In those cases they were highlighting where the customization will be. Unfortunately, quite of these were included [**R08**].

Risk Management is one of the key elements in the UB project model. People usually think that Risk management is complicated, and they try to avoid it. It is necessary to do it easy for people. In an early phase is important to understand the bigger things and action plans. Last thing is do it frequently, not only in the beginning, and with different project members [**R15**].

They had a risk evaluation in the project plan and they updated it after a couple of workshops, but only once. This could be a part that they could have worked more because they didn't look at this risk evaluation in the steering group later on [**R02**]. He thinks that they did a risk analysis but it was not revisited frequently and he proposes to update the risk analysis regularly for the BP2.0 [**R01**].

They did a risk list at the beginning but should have been emphasized more on it. It would be better to follow the risk management more often from the beginning. They didn't have any structured tool, they used more traditional ways [**R10**]. Risk Management is crucial during the entire project. He has talked with project managers that this should be part of

the project reporting. But they need to have a kind of template and a good follow up. It should be structured [**R09**].

K2 project has been a big investment in automate Vaasan production lines. The employees are still learning in the lines how to work with the new machines. Optimization is not finished. It is interesting to analyse this project because BP2.0 will be a bigger change for them. The goal in BP2.0. is to reduce all kind of paper lists (from the reporting points) in production and dispatching and digitalize those lists if possible. But it seems that new ERP is not supporting this goal because there probably will still be manual reporting through paper lists. Language will be another challenge with BP2.0. In the bakeries not everyone knows english, and the new ERP will be in english.

In K2 the workload and the feeling of stress were high, however, during the implementation the participants had a great team spirit and strong commitment. The support and information flows worked well. These are important precedents to learn for BP2.0.

In the bakery which is in Joutseno (UB Finland, frozen business), they have already had the BP2.0 implementation from M3 to AX. People were not used to use this kind of systems in their daily work. You need people there in the shop floor to teach them by hand and see what they are learning. Even though it was told that it would be the case, they didn't understand the size of the change. The change for shop floor workers, don't underestimate that. Role confusing, people don't understand the big picture and what impacts what.

4.3. Problem solving

The aim of this step is to arrive at the core problem for the identified Undesirable Effects (UDEs). For this, we will analyze the Unibake's project templates and plans corresponding to the 4 main UDEs groups. We are looking for gaps between what Unibake is currently using for BP2.0 implementations and the needs of Vaasan's planning stream that we can expect based on the previous UDEs analysis. Basically, what we are trying to find here is the possible future cause (core problem) for those UDEs in the new BP2.0 project. Once we discover it, we can create interventions to solve the real problem.

This master's thesis is not trying to reinvent the wheel, or audit how Unibake have documented the BP2.0 project. We are simply trying to understand what will be done by the project and if there is something additional that we could already do upfront before BP2.0 starts at Vaasan. Part of the master's thesis is to recognize what methods are included in the UBI approach to deal with these themes, where there are possible gaps and build solutions to meet them. Somehow, our mission is also related to bring visibility to Vaasan BP2.0 implementation.

But before we show the process to reach the gaps, which are the foundation of the core problem, one should understand the concept "9 approaches" that is the basis of the Unibake implementation model.

The primary objective of the "9 approaches" is to ensure that the unit gains the full benefits of the Business Platform, the governance and best practice processes by running the implementation in a standardized way. It is a methodology that supports a fast way to

deploy the BP2.0 to be able to get all Unibake units live in reasonable time. The "9 approaches" is a toolbox consisting of a main document and nine separate "approaches", each one with several modules inside:

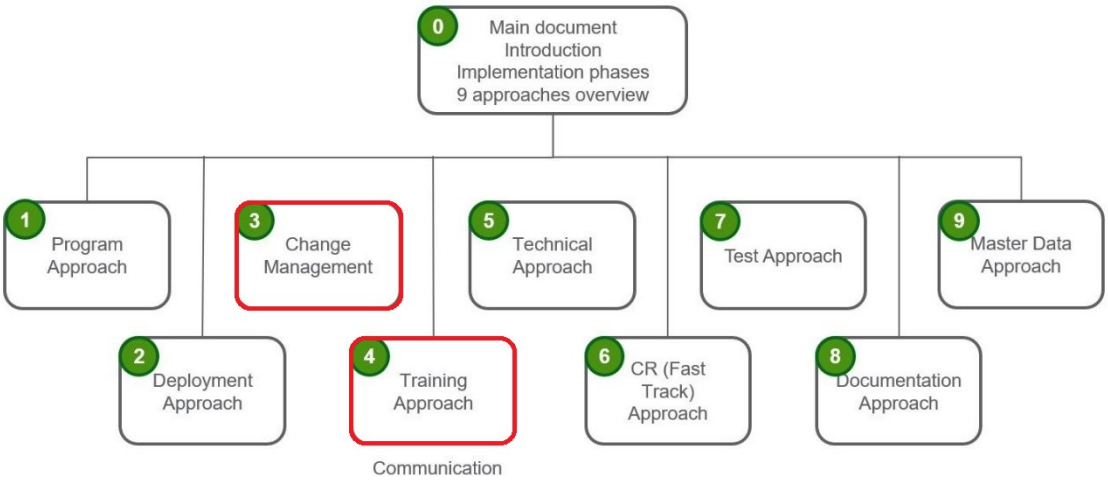

Figure 17. "9 approaches" documents

We have highlighted Change Management and Training approaches because the four main topics in which we are focusing on are included among their modules. For this reason, in the workshop that we had with the person responsible for Change Management in BP2.0 we asked about all the templates and plans related to those modules. Furthermore, Unibake has defined 4 different levels to classify all the processes in BP2.0:

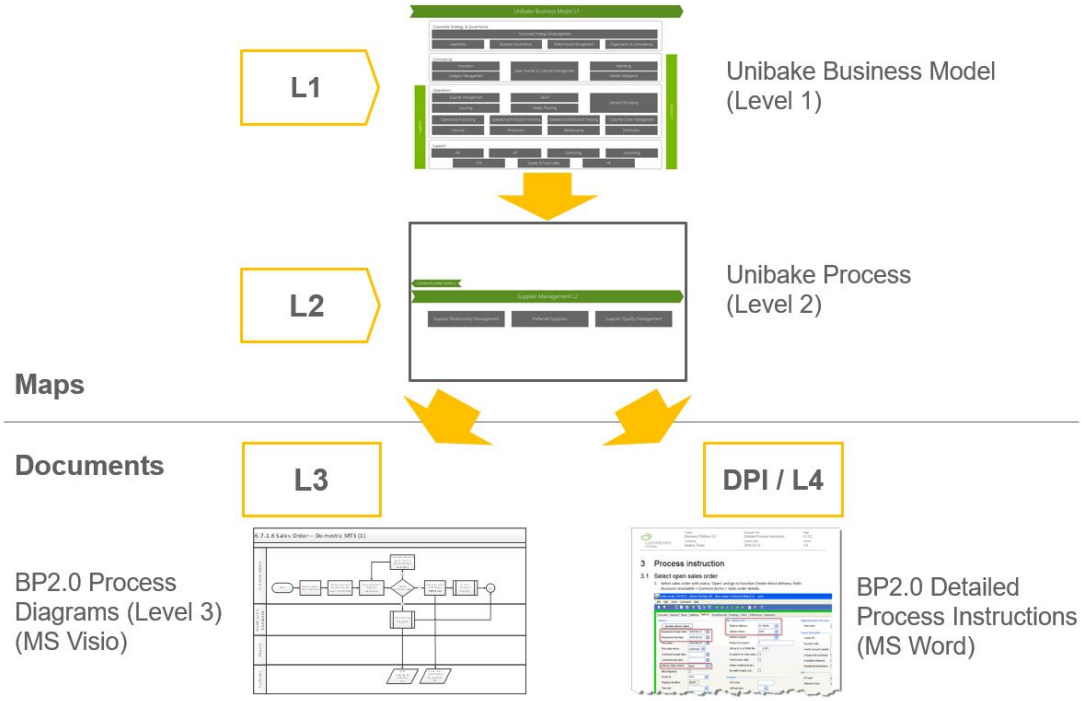

Figure 18. BP2.0 Processes levels

Now we are going to present all the templates we received from Lantmännen Unibake and, thereafter, we will explain them a bit more in detail trying to find possible gaps:

- The 70.20.10 Training Development Model.
- VAK learning styles questionnaire
- Stakeholder analysis → Risk Management
- Communication plan
- Role mapping
- Change Management plan
- Process charts and Detail Process Instructions (DPI)

The 70.20.10 means that most development comes from experience (70%), followed by learning through others (20%) and then formal development (10%). It's important to be aware that 70.20.10 is a reference model and not a recipe. The numbers are not a rigid formula. They simply remind us that the majority of learning and development comes through experiential and social learning in the workplace (the "70" and "20") rather than through formal classes and courses (the "10"). Of course, structured and directed formal learning can help, but it rarely, if ever, provides the complete answer.

UB sent us a learning style questionnaire, that classify the most common way the people learn. UB didn't have specific templates for evaluation of understanding, this is done during the training by asking the participants to complete the tasks they have been taught and asking questions as they are doing something. The Super User or Key User then determines if they have the knowledge needed to complete the tasks when working. No training adaptation for Key Users has been shared.

For Risk Management, they currently use the action plan on the stakeholder analysis to understand risks and how to manage them. They will also be starting to use a couple of new assessments to assess support and capability of managers to manage change in their teams and a group risk assessment which measures the amount of change within a certain department and the impact of this change on them.

No connection/link is found between stakeholder analysis and communication plan. They seem two completely separate documents. In addition, the communication, Change Management plan and Role Mapping are designed to be used in high level. The process charts and DPI use a sometimes confusing terminology and complex visualization.

The general feeling considering all these inputs is that it seems that Unibake has designed these documents and templates only for high level purposes. Vaasan is receiving from UB high level and a bit abstract and fragmented information. It is necessary to build bridges from high to more low level practical and clear issues if we want to meet the needs of the planning stream in Vaasan. That's the core problem that we have to solve with our solutions.

It is important to understand that these solutions will be additional resources to fill some gaps that we have found, but they are not substitutes for the existing UB solutions. This is not about bad or wrong documents, the question here is: what is missing? What else do we need?

4.4. Design propositions

Applying the Design Thinking process method in the Vaasan case study, we can draw several conclusions which can be formalized into what could be labeled a design proposition that consists of four actions or interventions:

1. Stakeholder analysis and communication plan
2. Key User role and training
3. Process tool and simplification
4. Terminology dictionary

All of them will be applied at the planning stream level. As part of the CMIO logic, we will justify in this chapter the use of those solutions specifying the mechanisms that link the interventions with future outcomes. In other words, we will explain what mechanisms we want to trigger with our four interventions.

4.4.1. Stakeholder analysis and communication plan

This intervention includes many "sub-interventions". Firstly, we have completed the stakeholder analysis for the planning stream following the steps indicated by Unibake in the presentations and templates. Secondly, a communication plan for such stream has been developed with the stakeholder analysis as the main input. Finally, we have unified all the stakeholder analysis tables and charts in only one Microsoft excel file, adding the stakeholder list and the power/interest matrix. Besides, two new tools are proposed to support the analysis: stakeholder mapping and the "communication eye".

Below one can find the power/interest matrix or Participation/Influence in Unibake terminology. The participation axis is focus on the BP2.0 project in general and the influence refers to with respect to the planning stream:

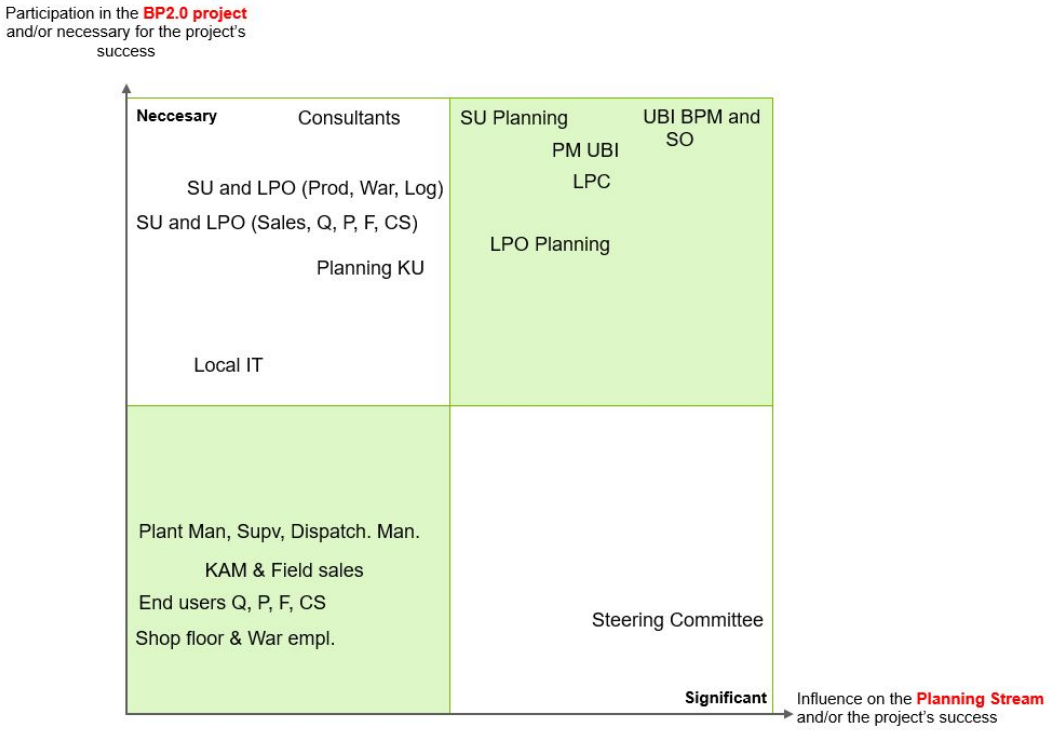

Figure 19. Participation/Influence matrix

This matrix was already a tool used by Unibake in the stakeholder analysis templates. It is useful to see the current situation of each stakeholder in the project but also to follow up possible changes during the project. We could say that is a visual tool that provide us with a big picture of the planning stream in BP2.0.

The rest of tools that UB is using for the stakeholder analysis are tables, not visual tools, and this is where our two proposals fit in. The idea is to start each step with a visual tool to transform it in a more dynamic process and also to have the possibility to see the big picture in each of the stakeholder analysis steps. Of course, the tables will continue having their functions, but we want to support them with something more visual and easier to maintain. This visual step can facilitate that the users use these tools more often. The stakeholder mapping is a tool coming from the literature and is shown below:

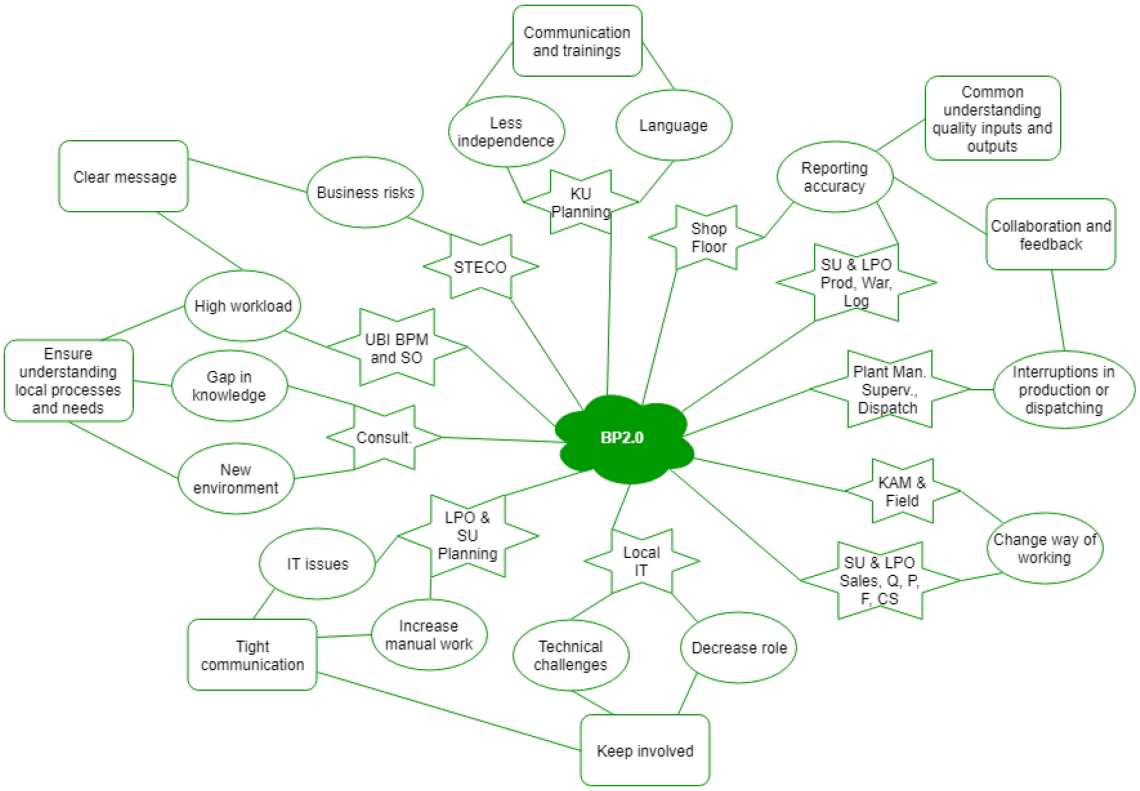

Figure 20. Stakeholder mapping

As it was introduced in the literature review, each layer represents valuable information about stakeholders (stars), problems (circles) and solutions (squares), all arising from the common mission: BP2.0 implementation (cloud in the center).

Within the Unibake project model, the stakeholder analysis is used as the main input for risk analysis and communication plan:

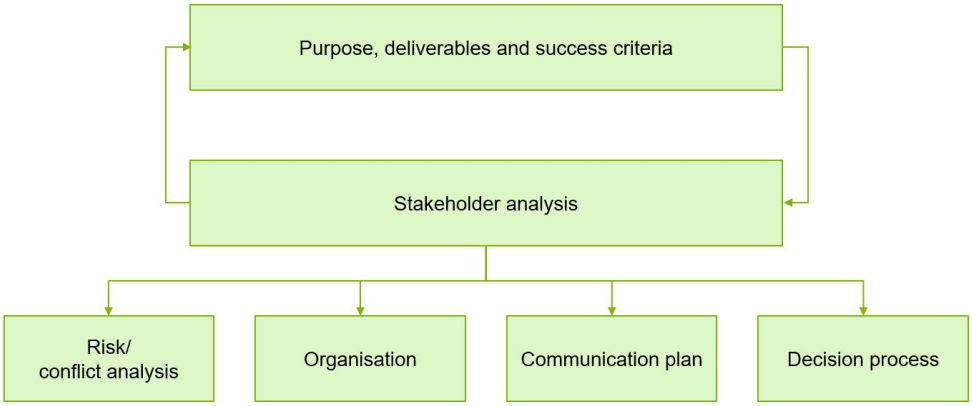

Figure 21. Purpose of the stakeholder analysis

The Unibake communication plan template consists of a table where each message between two stakeholders is expressed in one row with the frequency and the channel. Besides, the communication table seem to be disconnected with the previous stakeholder analysis. Communications is about links and it is difficult to see them row by row in a table. The approach is similar to the stakeholder mapping, but now we need a visual tool that connects the stakeholder analysis with the communication plan and allows the user to have a big picture of the situation. Our proposal is a mix between the UB table and the stakeholder mapping presented before. It is called the "communication eye".

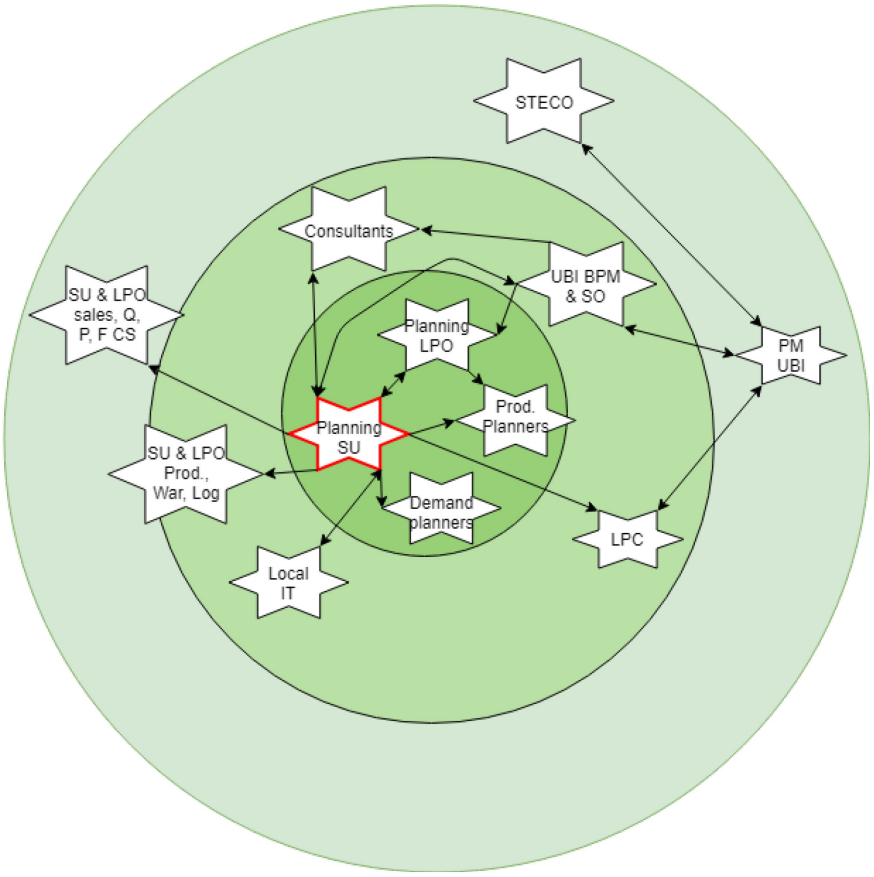

Figure 22. The communication eye

This tool shows two simple parts of the table: the messages flows with arrows and the frequency that each stakeholder communicates with the planning stream (less frequent in

layers further away from the center). We want to take advantage from links and positions in the same place to see the big picture of the communication at a stream level and check if there is something missing. It also shows possible critical resources during the project, what should fit with the stakeholder analysis. Management could encourage motivation using different communication mechanisms (Aladwani , 2001) based on "the eye". This would be a dynamic and visual tool to support the current communication table. The graph will evolve according to the project phase; figure 23 only represents the communication in the planning stream during the implementation phase.

In short, as one can observe in this chapter, now the relevant information related to the stakeholder analysis and communication plan in the planning stream can be condensed in three pictures.

4.4.2. Key User role and training

A need to clarify the role definition and training needs for Key Users in the planning stream has been detected. The aim of this solution is to fill that gap carrying out an interview with the Super User of the planning stream [**R01**] and create an input for the training plan that UB will adapt in the future for the BP2.0 Vaasan implementation. It is important to know that the concept Key User during the interviews was always related to the production stream, where the KU will support end users locally in each bakery. But for the planning stream the KU role and the associated requirements (skills and trainings) are different.

There will be two kinds of key users after go-live in planning that will have separated tasks: production planners and demand planners. In an overall level, the level of understanding and responsibilities is similar; they can both be called key users but the level of detail they will need to know is different from each other.

As Key Users they will have to understand the system well, what are the inputs that they receive and how their work affects others. They need to be able to work independently with the system (AX for production planners and SO99 for demand planners) and solve the most common situation and issues that come up because the support will be very limited. Many of the tasks need to be completed every day and within two hours, especially for the production planners, so if the problem is not related to technical issues or need for an admin user, they need to be solved. The consultants or Super Users (SU) won't be able to help the KU instantly if many of them are having a problem at the same time.

From planning point of view, they don't have any end users. It is different from production where they have a SU, the plant manager or supervisor as KU and they have then hundreds of employees working on the shop floor who are the end users. The difference between a KU and a SU role in the post-implementation phase is that a SU really needs to have the cross functional understanding of all the BP2.0 processes, whereas a KU don't need that complete view or very narrow detail knowledge about the processes.

In the pre-readiness phase, the SU is the main responsible in the stream to be in contact with Denmark (UB) and participate in the solution development that will be built for Vaasan. SU together with UB and consultants set up the system and this requires not only

the mentioned holistic understanding of the processes but also technical knowledge about the system. KU won't be involved at the same level, only maybe when the SU have some information to share with them from UB.

It could be beneficial for KU to participate in some of the trainings designed for SU, but it would be necessary to consider an evaluation of the Key User's ability to take part in a training in English. Although they decide that it could be good for them to participate in those trainings from UB, it might be that it is not possible for all the KU. If they don't understand enough, they couldn't benefit from those trainings.

When there are many participants with different skill levels in the same training room, it is hard to achieve a common level of understanding. If you adapt the level of the training to person with less skill level, then the training would be very basic for everyone. On the other hand, if you explain everything in a high level, half of the people don't understand anything. In Vaasan they don't know yet how it will be in practice, perhaps even having the SU training each KU individually.

The implementation phase in the planning stream includes the trainings for KU rather than for end users. At this point, the SU should have the knowledge to be able to train the KU in a very detail level. After go-live, the roles switch because is the KU who will be doing the work. The SU won't be working with the daily tasks. The knowledge required for KU trainings are more related to the system, how they work and what kind of possible problem can arise and how to solve them. The KU need to work quickly and solve problems by themselves from the beginning. The unique way to achieve this is with more and more on-hands trainings with test environment so that they will be doing the same task that in the real daily work with the real system.

KU trainings will take a lot of time because they will have to carry out their daily tasks while they are taking part in the trainings. From the SU it also will require a lot of time, but it also depends on the KU group divisions for the trainings that they agree to have (individually or small groups).

The UB learning styles questionnaire is good for KU to know their own learning styles, but it is not clear how it can help in practice and if they will be able to modify the training in some ways taking into account the surveys. The possible use will be limited.

It would be also useful to evaluate the KU during the trainings (Kirkpatrick, 2013). At least they should have some skill metrics in a checklist to be sure that they are not missing nothing with anyone and perhaps they could use that to see how well people know each point (auto evaluating). Then they would know particular and common needs to organize the trainings accordingly.

4.4.3. Process tool and simplification

Unibake is using Microsoft Visio to interact with the processes (L1, L2 and L3) and Microsoft words for the Detail Process Instructions (L4). It was a bit confusing to be familiar with the terminology that they use and the navigation in Visio with the DPI in a separate format was not smooth. To support the processes visualization and navigation with a simple and intuitive tool, we have created a PowerPoint solution proposal (Pinto, 2016) with all the processes linked in one place. Some ideas to improve the User

Experience (UX) have been also included. Now two pictures of our Power Point process tool will be shown while we reflect about how this can contribute to generate beneficial mechanisms.

This idea arose during one of the interviews, where **R10** mentioned that in UB bakeries the end users had been started to re-write some of the printed processes. Why not provide the Key Users in Planning stream with a simple digital tool to "re-write" the processes? There are some commercial softwares that provide embedded process explanations in the ERP. But we want something more customized for each user, not a general solution.

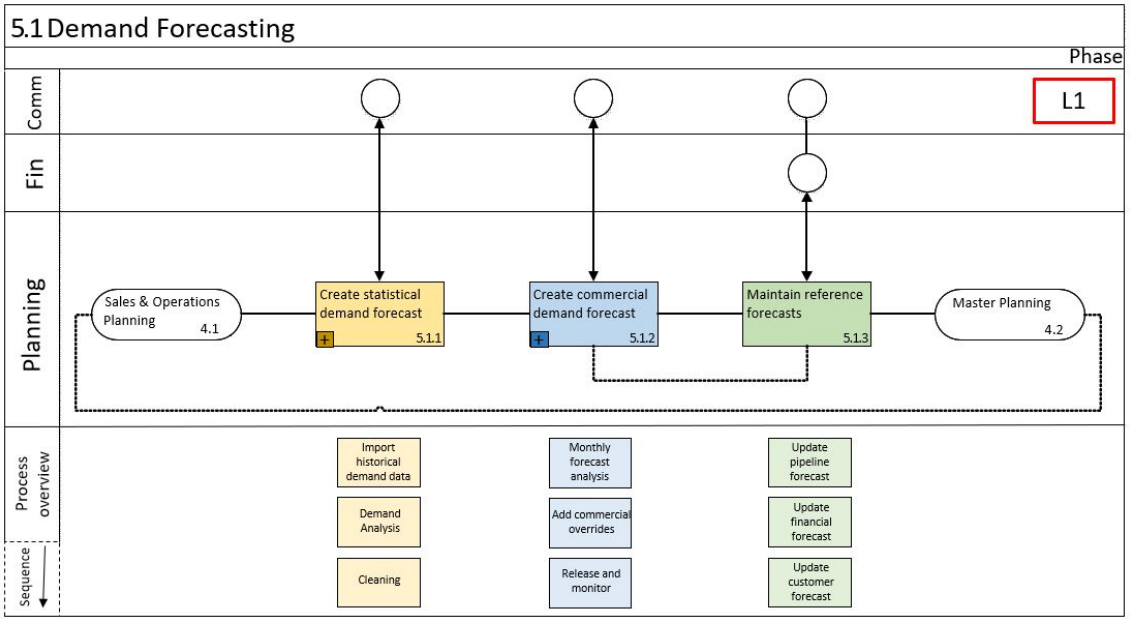

Figure 23. Level 1 PowerPoint process tool

It includes basically the same information that is in the Microsoft Visio but with some new features. By clicking in each box with the "plus" in L1 it will take you to the corresponding next level. In this case, the user just clicks to go to the next process, and it is not necessary to remember the process number to go to the right tab, like in Visio.

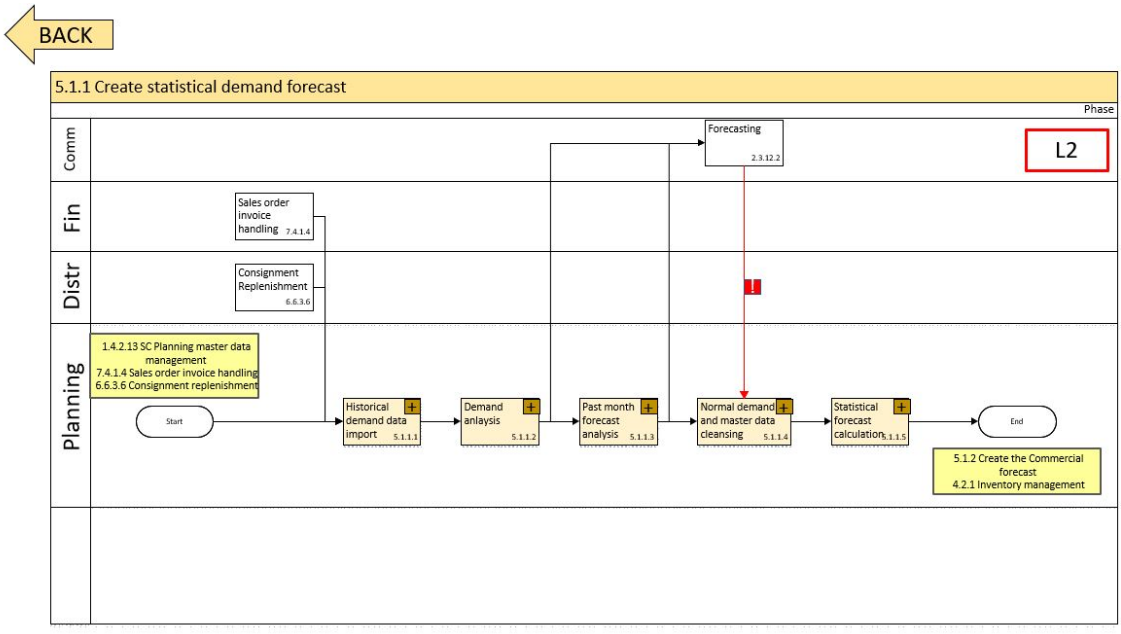

Figure 24. Level 2 PowerPoint process tool

Moreover, we have added an "amplification" in L1 with a process overview that gives you an idea of what you will find inside. The idea behind this is to increase the view of the user from the beginning in the high-level processes. It could be called an intermediate level between L1 and L2.

The introduction of colours can improve the visualization and the elaboration of tips on critical links can be useful to understand their relevance. The Key Users are free to add notes (customize). This could be a shared file as part of the trainings, it helps the user to be familiar quicker with the processes and also for the adaptation of new people.

4.4.4. Terminology dictionary

One thing that was identified from the interviews in Vaasan SO99 project was that in many occasions at least part of the project team had problems in understanding everything in the trainings and also later in the project meetings. It has been also found hard for the Project Manager in SO99 to choose the way to explain some things to the project team. For example, he hesitates about the use of SO99 related abbreviations and terms that will accurately describe the issue but will also require the audience to be familiar with and understand the language used. The other option is to avoid using abbreviations and explain everything from the scratch, but explanation will get very long, and the original idea will easily get lost.

Therefore, we thought that it could be good that the whole project team has common terminology that they understand and use. This set of terms could be in a form of a "dictionary" that the users could refer to any time. An attempt to do the same is the table in each DPI, but they only put the specific vocabulary that is necessary for each file separately. Mostly this dictionary would be aimed for key and end users. In this document, it could also be explained how the new AX or SO99 terms are related to terms previously used in Vaasan. This would generate a link to the existing knowledge people already have and help them adopt new concepts faster. It could be a working document (kind of

dictionary) that Super Users will, from time to time, fill something in. A proposal of what it might be like is as follows:

Area	Related to	Terminology	Abbrev	Definition	Link with previous
SO99	Forecasting	Statistical Forecast	-	The forecast that is calculated by SO99 based on the set master data and normal demand	Exactly the same as currently
	Forecasting	Commercial Forecast	-	Consensus forecast that is signed off by Commercial. Used in the short-medium term operational planning processes	At Vaasan cluster commercial forecast has covered the entire forecast horizon up to 24 months ahead instead of only short-medium term
	Forecasting	Commercial override	-	The volume of the commercial forecast. It is either adjusted after the statistical calculation or left untouched when it remains the statistical forecast value	Commercial overrides have been done in DCH monthly while in BP2.0 they will be done in SO99

Table 5. Terminology dictionary excel

4.5. Anticipating and evaluating consequences

The implementation obstacles are an important reminder that design scientists never work in a technological vacuum: all interventions take place in organizational settings. When the knowledge interest is theoretical, abstraction is possible, even encouraged. But when the knowledge interest is practical, we must accept the premise that it is not our theory but the empirical reality that ultimately defines what is relevant (Groop, Ketokivi, Gupta, & Holmström, 2017).

The desired outcomes for each intervention are: improve visibility provided by the stakeholder and communication plan, suitable training plan design for KU, facilitate processes learning and reduce misunderstanding during trainings due to technical terminology.

In an exercise of combinatorial innovation, we want to reflect about general outcomes that these interventions working together can bring to the BP2.0 Vaasan implementation. There are two main contributions: integration of templates to bring a holistic view to the planning stream level and the adaptation of tools to users' needs to speed up learning.

5. Discussion

5.1. Implications

The majority of past ERP implementation research has focused on finding the most common Critical Success Factors using many case studies. The lack of depth in those analysis is evident. It has been like an infinite loop in which the articles fed one another. Innovative contributions in this area have been very scarce. Researchers have very often focused on specific CSFs or compared the relative importance of CSFs and finally their solutions are a mix of findings of previous studies.

This Master's Thesis present a case study where the detailed analysis of the critical factors is one of the main inputs of a process, but the main objective is to discover and solve real problems that the company could face during the project. Our solutions have not only been based on theoretical knowledge, they are novel as a result of the design process. There will rarely be two exactly same solutions for two ERP implementation projects. Each project is a new world.

Additionally, another significant observation was the lack of stakeholder perspective in the success factors cited in the literature. In our case, the stakeholder perspective was included through diversity of profiles in the interviews. Special emphasis was placed on having end users in the interviews, something missing in previous studies. Doing this at the beginning, we could count on this vision from all levels throughout the design science process. The use of memorandums, not observed as a common practice in previous research, has facilitated and simplified the analysis process of the interviews. Normally, the number of interviews and the variety of stakeholders who participate have been poor in previous academic studies (Barsukova, 2013), (Mikkola, 2013).

Probably the most significant implication is the importance of the context that surrounds the ERP implementation. The meticulous understanding of the company context is the difference between developing viable solutions or not. As it was mentioned before, the empirical reality ultimately defines what is relevant. This "problem framing" phase is probably one of the weakest parties in previous analysis of case studies. They only present the management environment of the company and not the one that really affect the project.

Only two case studies with similar context complexity have been found in the literature (Al-Mashari & Al-Mudimigh, 2003), (Boonstra, 2006) but both researches described the situation from high level perspective rather than being part of a problem-solving team. This can be link with our core problem in the design process, where it was necessary to bring the information to a more detail or lower level. It is the same situation with the research in ERP implementation, everything is treated from above and there is a need to go to the more detail analysis of case studies trying to find gaps and developing creative solutions. This thesis brings to the literature a case study analysed in detail where diverse factors of the context, like many countries with different languages or the dependence of a central company, make this context unique.

Many strategies have been covered in the literature, however, strategies alone are not sufficient. In this thesis, a strategy has been proposed to systematically analyse the pre-

readiness phase of an ERP project. This strategy allowed us to find practical or "low level" tactics to fill some gaps in the planning stream.

It is interesting to note that researchers have focused more on the implementation phase while research in pre and post-implementation is limited. Our research focus has been in the pre-implementation phase of the BP2.0 project for the local implementation in Vaasan. The contribution comes from the possibility to better understand actual problems faced in the pre-implementation phase carrying out an empirical study of an organization that is adapting an ERP system.

Training is one of the most cited CSFs in ERP implementations, but few empirical studies have attempted to examine the characteristics of the training process. Training has been one of the main areas in our problem-solving step. It was one of the most common topics discussed during the interviews, due to its great relevance in any ERP implementation. If we look at the possible outcomes linked with our interventions, training improvement was the origin for some of them. The key is to understand the needs of the users that you will train.

In the literature there are missing new uses for stakeholder mapping application in different contexts. We have used it not only as part of one intervention but also to create a new tool to represent the links from the communication plan. Something to add is that in the stakeholder mapping we considered not necessary to classify the stakeholder as opponents and proponents, for us all of them are proponents.

5.2. Limitations of the study

The findings of this study depend to some degree on the selection of informants. A more comprehensive presentation of all the stakeholder groups in ERP implementations would have improved construct validity.

A higher number of interviews in general, even within the same stakeholder groups, would have been very beneficial for strengthening the reliability of this study and improving the quality of the results. In the same way, a higher number of articles in the literature review could provide a more accurate view about the state of the art in ERP implementation.

The qualitative data from the interviews could also have been complemented with quantitative data collecting empirical material through surveys to give additional perspective on the change impact.

The subjective criteria from researcher point of view to select the topics of the interview templates and to choose the relevant points from the memorandums are a limitation of the study because any decision in those critical points has a tremendous effect in the whole process. But to minimise this, there have been always support from one of the thesis' instructors trying to make it as objective as possible.

Of course, additional solutions could have been included as interventions, but we have chosen those that we considered more interesting for the project. Only the solutions considered within the scope of this thesis were selected. More time to develop the solutions in detail would have been beneficial. Before we reflected about the possible

outcomes of our interventions without any evidence, but the best way to observe their effectiveness would be during the real implementation.

5.3. Suggestions for further research

In this master's thesis a methodology to systematically analyse an ERP project during the preparation phase is proposed. It could be interesting in the future to follow the established method in more companies with different contexts to see the results that it provides. The objective would be to validate its use as a standardized methodology.

Regarding the interventions, further development to continue improving the "communication eye" is highly encouraged for future research.

In the same way than now standardization of processes is a trend in the world and Unibake and Vaasan are on it, there is room for a standard ERP implementation model. It is one of the most difficult and yet unresolved areas of ERP implementation and this thesis could be a starting point to create standardized tools to help companies in ERP implementations. We are not talking about a rigid model, because ERP projects are complex and very different from each other but it could offer standard tools for different purposes in each phase of the implementation. Another option would be that this model would have a support function. The suggestion to start an unified investigation line to design and validate a standardized ERP implementation model although could be challenging, is possible.

6. Conclusions

The main purpose of this study was to help Vaasan with the BP2.0 preparation through two main tasks:

Firstly, we have found very valuable learnings in the interviews from the demand planning tool (SO99) implementation considering all the possible stakeholders perspectives within the project. All the data collected here is the reference point on which our entire design process has been based. This allowed us to discover critical areas in which to focus our efforts.

Secondly, the big information input related to the Lantmännen Unibake project model allowed us to estimate how Vaasan's reality would fit with such model. This was accomplished analysing the methods and templates of critical areas and keeping in mind all the learnings and local requirements to identify several gaps. These gaps were filled with realistic and feasible solutions adapted to the planning stream future needs. The aim of these solutions is to minimize, at least, the risks that were discovered during the thesis. They are going to facilitate the change in the planning stream during the future ERP implementation. Another achievement has been to develop extrapolated solutions that can be used in other functions or countries.

But this is just a starting point, an activator element, as part of the preparation for the huge BP2.0 implementation that Vaasan will start soon. The complex context where this project takes place, forces the company to be continually searching for new gaps, which surely will emerge, and solutions to address them. This process itself has supposed a learning and it serves as an example of an iteration that Vaasan will have to perform again and again during the implementation.

Another theoretical aim has been persecuted in this project. We have shown how the analysis of a previous implementation project in a concrete stream can systematically identify gaps and solutions in an ERP implementation project. Learning from the past is a useful tool that everybody can use in a structured way. This concept supported by design thinking is a powerful combination.

Finally, which can be considered as the most important success factor for this thesis and for the future BP2.0 project, never mentioned previously in the literature, is the interest of the company object of the case study. The desire to change is the key. That's probably the most important thing, be open for new ideas and solutions [**R13**].

In Lantmännen Unibake they have already had success in the previous projects. People have started to be used to the system and to see the benefits [**R09**]. The next turn is for Vaasan and they are on the right track with the right people. The light is at the end of the tunnel, and to reach it all that remains is to be positive and act as a team.

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Appendices

Appendix A. Interview templates

The informant

BACKGROUND

POSITION IN VAASAN

ROLE AND RESPONSIBILITIES (project)

The project (SO99)

PHASES AND GOALS

IMPLICATIONS (company and individuals)

PREPARATION (trainings, meetings, etc.) → Level of detail

ADAPTATION

COORDINATION

STANDARDIZATION

CONSULTANT ROLE

PLAN VS REALITY

EVALUATION // RISK MANAGEMENT

REACTION (to challenges or problems)

SUCCESS FACTORS

LEARNINGS

EXPECTATIONS (BP2.0)

The project (BP2.0)

CURRENT ERP (M3)

NEW ERP: WHY

IMPLICATIONS (company and individuals)

PHASES AND GOALS

PREPARATION (trainings, meetings, etc.) → Level of detail

PROCESS LEVEL STATUS // STANDARDIZATION

COORDINATION (internal and external)

CONSULTANT ROLE

POSSIBLE OBSTACLES

EVALUATION // RISK MANAGEMENT

LEARNINGS (from build project or previous implementations)

SUCCESS FACTORS

EXPECTATIONS